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Laws for Railroads.

Railroad companies are pretty severely dealt with sometimes, and this we think has been the case with the New Jersey Railroad Company in a recent case, where a person named Kennard brought an action against the said company for damages, he having got his arm broken by having it extended out of the window of a car while passing over a bridge. It appears that the plaintiff, Mr. Kennard, whilst passing over the bridge on the road of the company, sitting with his back to the engine, with his arm out of the window, had it broken above the elbow, by coming in contact with some portion of the bridge. The bridge, it was shown, was of the ordinary width, and the company, in their defence, insisted upon the duty of passengers, when the train was in motion, keeping their arms inside, and not outside the cars; that if this had been done, no injury would have been sustained by Mr. Kennard.

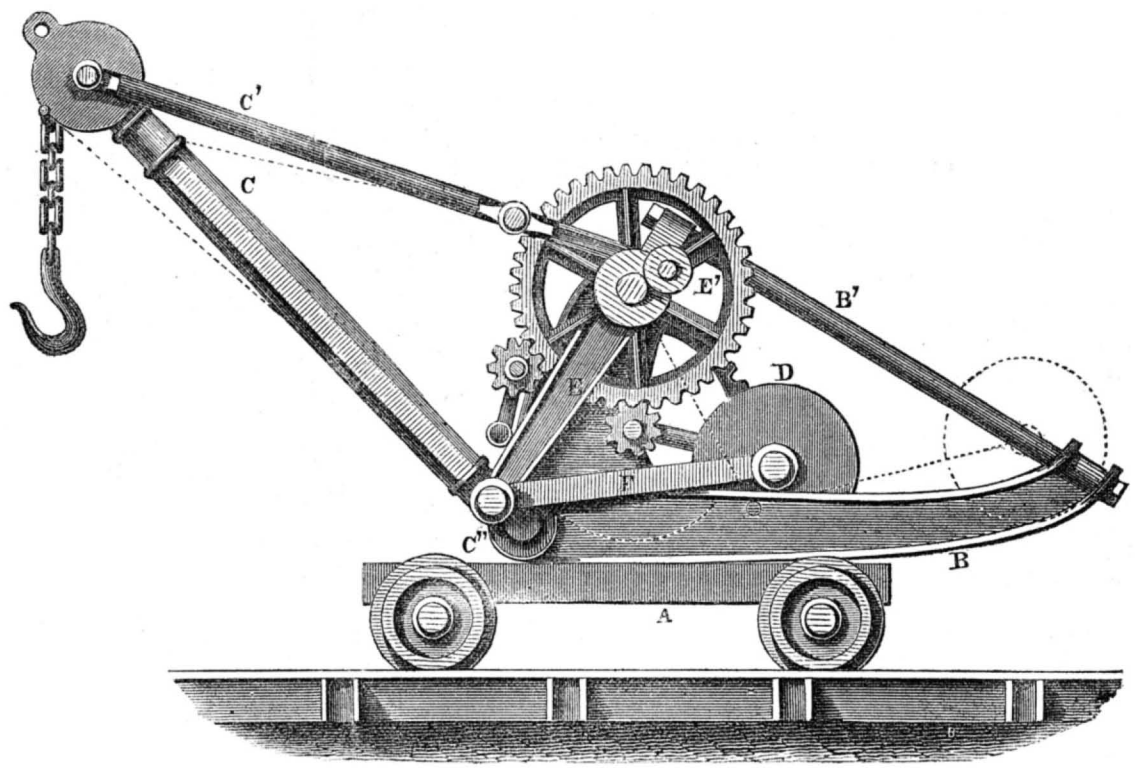
The Judge (Gibson) in his charge to the jury, asserted as law, some points which may compel railroad companies to adopt measures very annoying and inconvenient to the travelling community. The learned Judge decided that the notice in regard to keeping the arms and heads of passengers inside the cars, and all such notices, are good for nothing—that a railroad company is liable for damages, even in the event of their rules and notices being disregarded by passengers, because some may not see them, and some cannot see them, and some cannot understand the language in which they are written.

The jury rendered a verdict of $2,500.

The Boston Railway Times has some very appropriate remarks upon the subject. It considers the charge of the Judge and the verdict rendered the reverse of common sense. Although we have thought that many of our railroad bridges were too narrow, we never could blame a company for a passenger getting his arm broke by disobeying the positive rules "do not look out of the windows."—Unless passengers obey the railroad rules of safety, how can the company take care of their lives and prevent accidents? In France they used to lock the doors to prevent accidents, and at one time a car took fire and many people were consumed because they could not force the doors. Judge Gibson, we presume, would be the last man to allow railroad companies to put chains around their passengers to keep them from moving, or to charge a jury to render a verdict against a railroad company because some *non compus mentus* person jumped out of a window when the cars were running at a high speed, and yet the above charge looks as if he would.

If we take a view of the case from another point, however, we may be ready to accord justice to the charge of the judge and righteousness to the verdict of the jury. Who has travelled by a railroad, in summer, along with a number of children, and not trembled oftentimes for their safety by the insecurity of the windows? Wire screens or stuncheons should be placed inside or outside of railroad car windows.

CRANE FOR RAILROADS.



This crane is the subject of an English patent granted to Mr. Perceval M. Parsons, C. E., London, on the ~~10th~~ of May, last year. The engraving is a side elevation. It is intended to be employed upon railways, and, therefore, is mounted upon a truck or carriage, A B, one of the two sides of the crane-framing projects backward, or in the opposite direction to the jib, C, for a considerable distance, and is provided near the lower edges with flanges or ledges projecting inwards, upon which the cylindrical or rolling counter-balance weight, D, moves. These flanges are of gradually-increasing inclination as the distance increases from the centre of the pillar or point of suspension of the frame to B', one of two stay-rods or bars connecting the top of the framing with the extreme outer ends, and these take the strain caused by the moving outwards of the balance-weight, D. C' is the jib stay-rods, which take the weight or strain of the suspended weight or load. The inner ends of these rods are attached, not to the top of the side framing, but to pins, or studs, E', fixed eccentrically to two levers, E, placed one on each side of the crane. These levers are mounted upon the ends of the barrel-shaft, and have their lower ends attached by connecting-rods, F, to the axis of the movable counter-balance weight, D. The jib, C, is jointed at its lower end to the crane-framing at C''. The action of the crane is thus—the load, or weight to be raised, being attached to the hook of the chain, the toothed gearing is put in motion, and the weight lifted. This will have the effect of causing the jib to descend slightly, and by its connection with the stay-rods and the levers, E, move those levers, and through the connecting-rods, F, move the counter-balance weight, D, outwards from the position shown. As the flanges or the framing upon which it moves, increase in inclination, the balance-weight will soon arrive in such a position as to balance the weight or load upon the end of the jib, when the maximum of weight which the crane is intended to support is applied, the balance-weight, D, will move outwards to the extreme ends of the framing, to the position shown in the figure by dotted lines. The jib, C, stay-rods, levers, E, and connecting-rods, F, will then assume the position also shown by dotted lines, and with any weight suspended from the jib less than the maximum, the balance-weight, D, will be moved out a distance proportionate to that weight, so as to balance it and prevent any strain upon the central pillar or pivot, and the rods and levers will then assume some intermediate position in proportion to that weight. The spur gearing attached to, and working the crane, is of the description usually employed in those machines.

The improvement consists in the adaptation to the crane of a movable counter-balance weight, which is moved outwards from the point of suspension of the crane in a self-acting manner, by a weight suspended from the end of the jib; the effect of which will be to throw the strain equally upon the back and the front or jib stay-rods of the crane, and thus balance the load upon the central pillar or pivot.

Malaga Raisins.

The editor of the Rochester Advertiser, while American Consul at Tangiers, made an excursion through the South of Spain, and in the course of his jaunt passed through the country in the vicinity of Malaga, where the most delicious raisins are grown. He thus describes the very simple manner in which the choicest raisins are prepared:—

"You have often partaken of the Malaga raisins, the most delicious of all preserved fruits, and so have all our countrymen; but every one may not know how they are prepared. The process is the most simple imaginable. As soon as the grapes begin to ripen, the vine-dressers pass through the vineyard and cut the clusters off from the vines, and leave them on the naked ground, turning them over daily, until the heat of the sun and the warmth of the earth upon which they lie, have baked and dried them, when they are gathered up, put into boxes, and are ready for use. This is all the wonder and mystery there is in preparing this delicious fruit. To my inquiry why they did not place leaves, or some clean dry substance of the kind upon the ground, for the fruit to lie upon, I was told that the naked ground was much better, that, in fact, the fine flavor of the fruit was dependant more upon the warmth of the earth, than the more external heat of the sun. Care has to be taken, however, that the fruit does not get wet while undergoing this process. But as it seldom rains during the summer or vintage in this country, it is very rarely that the fruit has to be taken up before it is dried.

The vintage, or season for gathering the fruit, commences the middle of August. Now—in April—vine-dressers are busily engaged hoeing, digging, and hilling them up, very much as the farmers in the States do their corn, potatoes, &c. They use for the purpose hoes somewhat resembling a pick-axe, excepting that the one side has three long prongs, with which they loosen the earth very effectively. The soil generally resembles a light and sandy loam, and does not appear capable of producing scarcely any vegetation. But the grape and olive, you know, will flourish were almost any other vegetable will starve and perish. In all that part of the south of Spain through which I travelled, from Cadiz to Malaga, Granada, &c., this same barren, sterile appearance of soil is apparent upon mountains and uplands. The general surface of the country is not merely undulating, but mountainous—to a far greater degree than I had any idea. I do verily believe that these arid hills and mountains comprise nine-tenths of the land in the province of Andalusia, and that the fertile spots—the vegas or valleys—only constitute one-tenth. But these latter are the gardens of Spain."

Marble Cement.

The following receipt was published in volume 4, of the Scientific American, but as the receipt is a valuable one, we publish it again for the benefit of those who may not have been subscribers so long ago:—

VALUABLE RECEIPT.—Take plaster of Paris and soak it in a saturated solution of alum, then bake the two in an oven; the same as gypsum is baked, to make it plaster of Paris, after which they are ground to powder. It is then used as wanted, being mixed up with water like plaster and applied. It sets into a very hard composition capable of taking a very high polish. It may be mixed with various coloring minerals to produce a cement of any color capable of imitating marble. This is a very rare receipt, and is worth twenty dollars to many of our subscribers, any of whom can prepare it for themselves.

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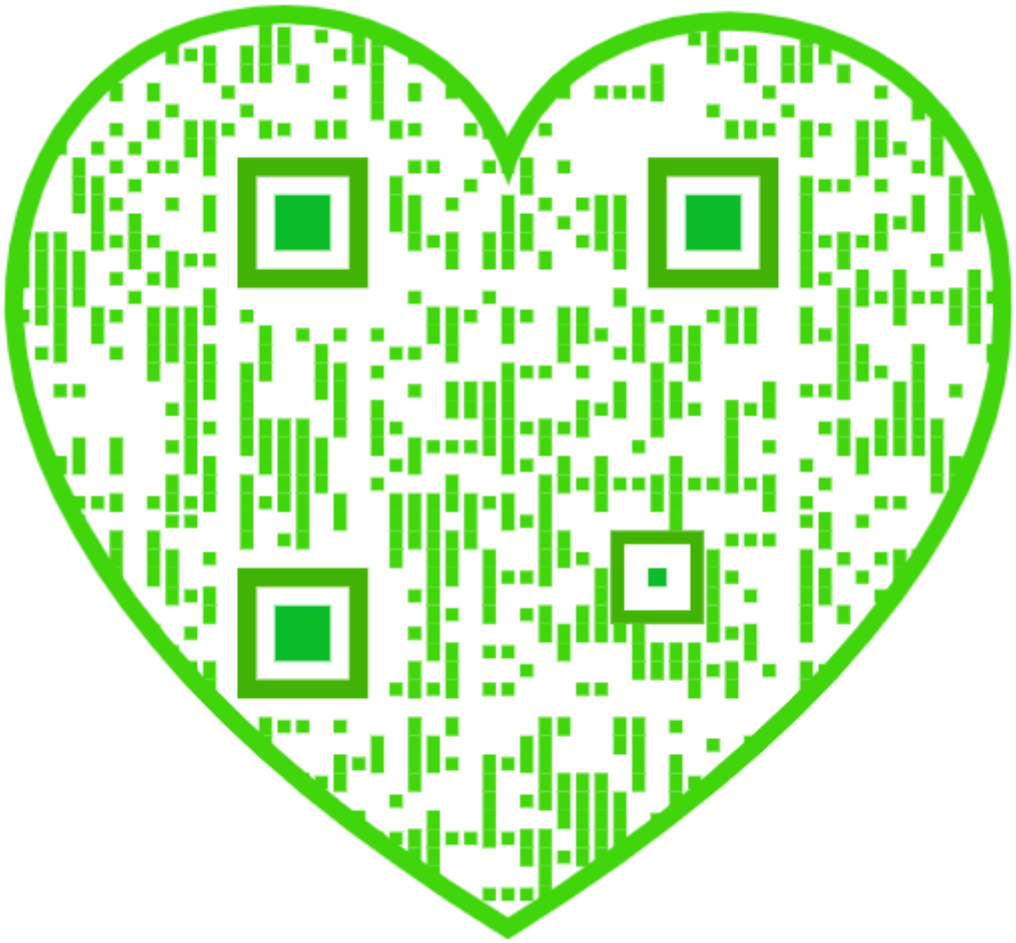

MISCELLANEOUS.

(For the Scientific American.)

Geology of the Lead Mines.---No. 1.

We commence this week a series of articles on the lead mines. They will embrace but a few papers. They are from a gentleman in Galena, Ill., who has obtained the facts from personal obsevration and authentic sources, and they are the first articles of the kind which have ever been presented to our readers.

"Does the galena in the Northwestern Mines extend through the superficial stratum of rock, into the supposed limestone beneath, or has its greatest depth been already attained?"—Jeff.

The only answers that have yet been given to your question, are to be found in the Reports of D. D. Owen, M. D., who made a Geological Survey, under Instructions from the Department, in 1839, and again in 1848. Extending, as his Surveys did, over the whole Mineral Section, and characterized, as they are, for accuracy, we do not hesitate to place full reliance on his Surveys, nor hesitate to say, that they are founded upon facts that will fully bear him out in his conclusions. Speaking of the Lower Magnesian Lime Stone Stratum, he says:—

"It is not until the geology of the country has been clearly inspected, that one is able to discover that the hills which present themselves to view, below Turkey River, do not belong to the same geological era, as those which appear above the mouth of that stream. Nay, so uniform are they in their general aspect, that the miner himself, who has passed the best part of his days in excavating and exploring their recesses, is wont to regard them as identical. So they are, looking to their chemical composition. Both are limestones, highly magnesian, in heavy beds of great compactness and durability. But they are separated from each other by from one hundred and fifty to two hundred feet of other strata. The lower magnesian limestone, as it presents itself north of the Wisconsin, has many characteristics which indicate a metalliferous rock; it is seen in thick and solid walls; it is intersected by spars, chrystalizations, and vein stones, such as usually accompany metallic ores. It has many points of analogy with the upper magnesian limestone of the Galena and Dubuque Districts.

The lower magnesian limestone may, in one respect, be considered more favorably situated than the upper, as a mineral bearing rock. It is an established fact in Geology, that all other things being equal, the older or lower a rock is, the more likely it is to be metalliferous; because nearer the sources from whence, experience indicates, that metallic materials find their way into its recesses; in other words, because in close proximity to granite and chrystalline rocks. And it has been shown that the inferior beds of the lower magnesian limestone, of this section, lie at least two to four hundred feet below the lead bearing beds of the magnesia limestone, and are separated from the chrystalline and igneous rocks by the lower sandstone only. There can now be little doubt that the whole mining region is based upon a sientiic and granite platform, which would in all probability be reached by penetrating to the depth of from one to two thousand feet.

These facts, taken together, may be considered favorable to the metalliferous character of this formation. And I am able to bring several actual discoveries in corroboration of this inference. Near the base of the Bluff, composed of lower magnesian lime rock, on the west side of the Mississippi, some fifteen miles above the mouth of Turkey River, and just above the French village, from 7 to 10 pounds of lead ore was obtained from openings in the rock by Dr. Andros.

We need not, as we already have done, quote the exact words of Doctor Owen, in giving the details, in relation to other places where minerals have been discovered in this formation, but would mention localities only, viz:—Near the mouth of the Kickapoo—near the Great Bend of the Kickapoo—between the Yellow River and the Upper Iowa—on the Wazi Ojee, and at other places.

Dr. Owen continues:—"The above instances prove that the lower magnesian limestone is lead bearing. But the facts before us at present are not sufficient to enable me to say whether it exists in productive quantities. At many of the above localities, the rock is exceedingly cherty, and is consequently hard, difficult and expensive to work; and near the surface the ore is much scattered and disseminated through the rock rather in horizontal openings than in vertical veins. But if this surface ore should be connected with deeper seated lodes, as there is reason to think it may be, then these would be well worthy the attention of the miner.

At the mouth of the Wisconsin, Doctor Owen has given us a diagram of the formations of that point, above the level of the Mississippi. The first 30 feet is of lower sandstone; next, lower magnesian limestone, two hundred and thirty feet thick; next, sand, blue and grey fossilliferous limestones, one hundred and fifty feet thick; then the upper magnesian limestone of this district, fifty feet thick; capped by ten feet of soil." We have thus given from the doctor's Report, and in his own language, a condensed sketch of this formation.

"The instructions given by the Secretary of the Treasury, in February, 1839, required Doctor Owen to proceed to Iowa, and undertake an exploration of all the lands in the Mineral Point and Galena districts, situated south of the Wisconsin and north of the Rock Rivers, and west of line dividing ranges eight and nine, east of the fourth Principle Meridian, together with all the surveyed lands in the Dubuque district, comprehending, in all, upwards of three hundred townships; and this exploration he was required to complete before winter should set in."

He commenced on the 17th of September, at the mouth of Rock River, and proceeded north and closed his work on the 24th of November; having completed his work in two months and six days.

It is to his Report that we are indebted for our facts; and we would here observe, that it is a matter of surprise that he could, as daily experience teaches us he has, have made the surveys and explorations in sixty days, with any thing like the accuracy with which it is performed. And we believe that there is no other instance where such a mass of information and facts, in relation to so large a district, has ever been collected in anything like the same time. His collection of fossils and minerals; his minuteness of detail in relation to the whole survey; prove conclusively his standing, as one of our best practical and scientific Geologists.

The extent and position of the lead region now under consideration lies chiefly in Wisconsin, including a strip of about eight townships in Iowa, ten townships in the northwestern corner of Illinois and about sixty-two townships in Wisconsin. The entire region, then, comprehends eighty townships. The extreme length of this lead and copper region, is, from east to west, eighty-seven miles; and its width from north to south, fifty-four miles. The highest points are the Blue Mounds, rising one thousand, and the Platte Mounds, six hundred feet above the level of the Wisconsin River. The principle formation throughout this district, is the upper magnesian limestone. It extends south to the northern boundary of the Great Illinois Coalfields, near the head of the Rock Island Rapids, where it disappears under the coal beds; thus giving us assurance that we are in a formation that underlies the coal. It extends north to a short distance above Prairie du Chien, where it is seen capping the hills. The next stratum underneath this is the blue limestone; under this is the upper sandstone, and underlaying this is the lower magnesian limestone. It will thus be seen that all the mines now worked are in the upper bed of lead bearing rocks. Daily experience teaches us that the Doctor's observation was and is correct, as the blue limestone, that directly underlies the upper magnesian, has been struck at many points in our mines, at from 50 to 120 feet from the surface. Up to this time there have been no shafts sunk to any considerable depth in the blue limestone, consequently it is impossible to form an estimate of its thickness, or of the intervening strata of lime and sandstone, between the upper and lower magnesian lead bearing rocks. At Prairie du Chien, and at points on the Wisconsin, these deposits are about 150 feet thick; still this is no sure indication that we might not have 150 feet, more or less, to penetrate, before we should reach the lower magnesia. E. H. B.

Francis' Life Boat.

A correspondent of the New York Daily Times states that there is not a metallic Life-Boat in the whole British service; he mentions this as a most extraordinary thing, because there are so many iron ships employed there. He believes that in cases like the burning of the unfortunate Amazon, they are far preferable to those made of wood. He recommends Francis' American Metallic Life Boats, and so do we: they are the best lifeboats extant.

It appears the British authorities have made a rigid investigation into the causes of the burning of said vessel. All the survivors have been examined twice, and the most thorough cross-questioning has been undergone by every one of them. As yet, they cannot account for the accident, but a very singular fact has been brought to light, viz., that before the accident occurred, there was a fearful impression of some impending danger on the mind of every one, and for which they could not account. It was, as Campbell hath it, "coming events casting their shadows before."

British Metals.

The history of the combinations of copper with tin and zinc, proves of much interest from the circumstance ot the probability that all the tin employed by the ancients, in the formation of their bronzes, was derived from these islands. The Celts, which are found in the bogs ot Ireland, and also in the mines o. Cornwall, are bronzes, containing, all of them, the same proportion of tin, and such as very generally characterizes all the bronzes, whether coins or specimens of useful or ornamental manufacture, of the Greeks and the Romans. This is a point which gives great probability to the statement that the Phœnician merchants visited these islands, especially the western part of them, for tin. The Cassiterides, or tin islands of the Greeks, there is every reason for believing, were those parts of the British Islands with which the mariners of the Mediterranean were acquainted.—[London Art Journal.

Bolt Heading Machine.

In last weeks Scientific American there was an advertisement of Dr. S. McLean, inviting persons to witness the operation of Van Brocklin's patent bolt heading machine, in the blacksmithing establishment at 45 Gold street, this city. We witnessed the operation of heading bolts by this machine, and were highly pleased with its performance. The machine is only about 3 feet long, and 1½ feet wide, yet it is adapted to cut bolts to their proper length, head them, cut screws on them, and also tap nuts. For blacksmith-shops it is a capital invention. It has a die box and die socket for the bolt. The cut rod for the bolt is made red-hot in the fire, then placed in the die socket with the tongs, one turn of a crank brings the die box on the top of the red-hot rod, then with a hammer two blows are struck on the head of the die box, which is of steel, and the head of the bolt is formed. By striking lightly on a step below, the bolt is thrown out of the socket in which it is retained while the head is being formed. The heads of bolts, according to the forms of the die, may be of various forms, and ornamented for use or fancy. It is adapted for copper as well as iron bolts.

Disinfecting Lamp.

The Boston Medical and Surgical Journal says:—

A note from a medical friend reminds us of a beautiful, simple, economical apparatus for overcoming bad odors and purifying any apartment where the air is loaded with noxious materials. A description of it has already appeared, but the reference, in the note alluded to, has unfortunately been mislaid. The whole matter, however, is simply this:—Take one of any of the various kinds of glass lamps—for burning camphene, for example—and fill it with caloric ether, and light the wick. In a few minutes the object will be accomplished. In dissecting rooms, in the damp, deep vaults, where vegetables are sometimes stored, or where drains allow the escape of offensive gases, in out buildings, and in short, in any spot where it is desirable to purify the atmosphere, burn one of these lamps. One tube, charged with a wick is quite sufficient. This suggestion is really worth remembering for the comfort of a sick room, because it is easily accomplished, agreeable, and more economical for purifying than any process now known.

Middle Rail to Prevent Cars Running off the Track.

Judge Carpenter, of Rome, N. Y., has invented a means of preventing railroad trains from running off the track. This invention consists of a middle rail placed in the centre of, and raised considerably above the two outer rails, and fastened to the same cross-ties. A saddle is attached to the engine and cars at both ends, which sets over the middle rail, with friction rollers to play on both sides of it, thereby preventing the cars from rocking or running off. Whenever there is a tendency to run off, these friction rollers play against the middle rail, and bring them back to their place again. It costs $500 a mile, and an adoption of it could be made to assist trains in ascending elevated planes.—[Exchange.

[It strikes us that we saw a model of a like invention, exactly, in 1840, exhibited before the New York Legislature at Albany.

The Age of Gold and Iron.

A short time ago, every body was saying this was *the age of iron*, and among the rest we said so too. It may be that we will soon have to change our tune. Since gold was discovered in California, we hear of but little else than gold, gold. Iron has become ruinously cheap, it is imported below par, for it is morally impossible for our iron manufacturers to make it at present prices. All our iron makers, we suppose, have gone, or are going to California, where, if they, want iron, they willbe more able to exchange gold for it, than make it. Last week the Daniel Webster, steamship, took 600 passengers from this city bound for the gold regions. Some parts of Maine are now nearly depopulated, it is said; there is nobody left but women, children and old men. Australia too, is now pouring her gold into British coffers, and the end of new discoveries is not yet. Steel pens were once the only opponents to quills, but gold pens are now claiming attention. Silver is looking up, but as for iron, the gold seems to have fairly overclouded it.

Railroad Accidents.

The number of accidents continue to be as great, if not greater than ever, on the New York and Erie Railroad. Two accidents occurred last week—the one by a train running off the track into the Delaware river, and the other by a freight train running into the Express Train while the latter was standing still at Deposit, waiting for the passengers to dine. Seven deaths, we believe, were occasioned by these two accidents. There must have been gross neglect and bad management somewhere, but like all our explosions of steam boilers, nobody will be to blame. There is such a general sympathy exercised towards all people, now-a-days, whenever they are blamed for crimes and apprehended for the same, that we may soon expect to see subscription papers handed round to build monuments to some of the most noted murderers who have recently been executed.

New York Mechanics' Institute.

This institution, on the corner of Bowery and Division street, has had its rooms all repaired since the fire on the 27th of last December, and the second course of classes for drawing and modelling were formed on the 16th inst. There are twenty lessons in each course. Those of our young mechanics who have a desire to be something more than mere hewers and chippers, should become members of this institution.

Cement to Mend Earthen and Glass Ware.

This cement sold about the country as a great secret, is nothing more than shellac melted and drawn out into sticks. Heat the article a little above boiling water heat, and apply a thin coating on both surfaces of the broken vessel, and when cold it will be as strong as it was originally.

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Sulphate of Quinia---Its Use and Abuse.

The New York Medical Gazette contains an excellent article on the use and abuse of *quinia*, by R. L. Madison, of Petersburg, Va. He speaks justly, we think, against indiscriminately using a medicine without any rational indication for its application. He states that the indiscriminate use of a medicine like calomel (which is as good as any other when rightly applied) has brought disrepute on professional character. Here is what he says about the Peruvian Bark and the sulphate of quinia, which is derived from said bark:—

"The cinchona bark, from which the substance quinia is extracted, has derived its name from the Countess of Chinchon, wife of the viceroy of Peru, to whom the medical world is indebted for its first introduction into Europe in 1640. It soon afterwards fell into the hands of the Jesuits, and became to that order a source of great pecuniary emolument; since which time, notwithstanding the opposition at first inspired by its extravagant price, and the violent prejudices conceived against its use, it has continued constantly to advance and steadily to maintain a highly reputable character with the profession generally; and at present it has well nigh reached the acme of its popularity, and stands forth the crowning glory of anti-periodics. But this very popularity to which it has so deservedly attained, seems destined, ere long, to be the means of bringing it into disrepute, by causing it to be perverted from those uses to which all past and present experience has assigned it, and by endeavoring to make it fulfill indications entirely at variance with its well known therapeutic action. No one can entertain a higher opinion of the anti-intermittent virtues of the sulphate of quinia than myself. Restricted to this sphere of action, it certainly stands without a rival. As a tonic it has both equals and superiors; but the practice of exhibiting this medicine in enormous doses as a sedative in inflammatory affections, and as an able adjuvant to the lancet, is becoming to a considerable extent fashionable with physicians, especially at the South.

This practice I consider is pernicious in the extreme; for all experience indubitably proves the sulphate of quinia to be an excitant, not only of the nervous, but also of the vascular system; the cerebral disturbance evinced by a feeling of fullness in the head, ringing, buzzing, or roaring in the ears, and partial deafness, is almost invariably produced by small doses; in larger ones, in addition to the above mentioned phenomena, it has occasioned intense cephalgia, vertigo, deafness, loss of sight, with dilated and immovable pupils, loss of speech, delirium, coma, and great prostration; it has even proved in these large doses the obvious cause of death, by co-operating with the disease in establishing intense inflammatory action in the brain. Occasionally, when administered in certain morbid conditions of the system, it has been known to produce diminution of the heart's action. But may not this effect be justly ascribed to the intense excitement of the quinia, acting in such a manner as to obtend the nervous power of the brain and to paralyze its energy? Everybody knows that the most powerful stimulant, when given to excess, will produce sedation, and yet no one would be rash enough to resort to such means as a cure for an inflammatory affection.

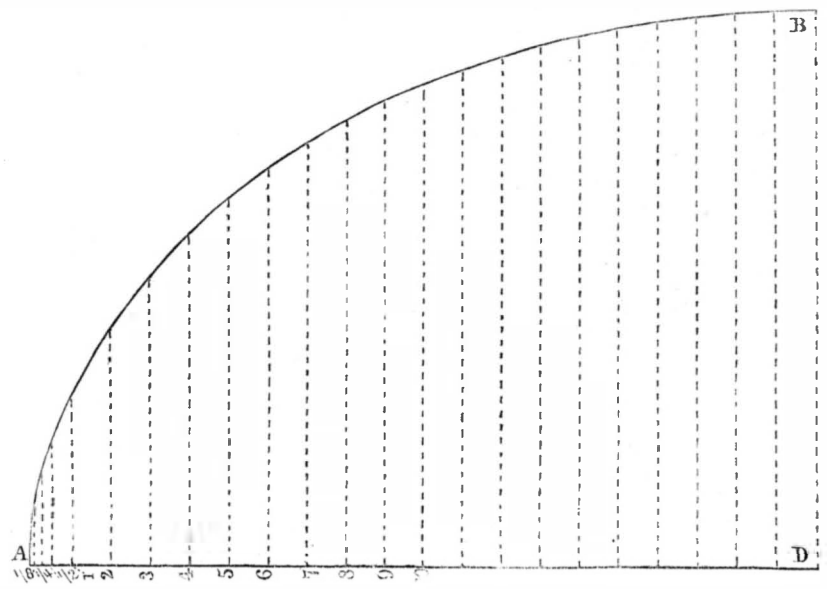
This practice, therefore, of using sulphate of quinia in very large doses is much to be deprecated, not only because it is thus diverted from its legitimate sphere of action, but also because, by this wasteful and injurious mode of administration, its price is enhanced to such a degree as to place it beyond the reach of the poorer classes in every community. For this last reason, if for no other, it becomes interesting to inquire, what is the smallest quantity upon which we may with safety rely for the arrestation of any given paroxysm? This must of course depend upon the nature of the paroxysm, the duration of the malady, the time at which the medicine is administered, and the constitution of the patient. Now, my own experience together with that of a number of physicians with whom I have conversed on the subject, induce me to believe that it is rarely necessary to administer more than 16 grains in the intermission of a disease or in the remission of a fever—this quantity having proved in a majority of cases, entirely adequate to arrest periodicity in any form. In some cases eight or ten grains will be quite sufficient. As regards the mode of exhibition, I greatly prefer the solution, not only because it is thus more easily absorbed, and more speedily produces its effects upon the system, but also because you are enabled to give the entire dose two or three hours before the expected paroxysm, and thus obviate the necessity of disturbing the patient's rest."

A fact About Winters.

It is a curious fact that, whenever the winter is unusually severe on this side of the Atlantic, the season is uncommonly mild in Europe. The warmest winter we remember was coincident with one in the old world so severe that it has almost passed into a proverb. The present season that has been here so intensely cold, has proved so genial in Paris that apoplexy, caused by the high temperature, has become, as it were, an epidemic. Cannot some scientific friend furnish a solution to this riddle?—[Phila. Bulletin.

[This has not been so this winter in Europe. The weather in Paris may have been mild, but in Britain and parts of the continent of Europe it has been unusually severe.

ORDINATES OF SEMI-ELLIPTIC ARCHES.



Let A D (see fig.) = semi span = s

Let B D = height = h.

To find the ordinate x at 1-10 the semi-span from A toward D. Then from Conic Sections we shall have

As $(s \times s) : h^2 :: 1\text{-}10\ s : (s + 9\text{-}10\ s) : x^2$

$s^2 : h^2 :: (1\text{-}10\ s^2 + 9\text{-}100\ s) : x^2$

Or, taking the extremes and means, we have

$$s^2 x^2 = (1\text{-}10\ s^2 h^2 + 9\text{-}100\ s^2 h^2)$$

Dividing by s^2

then $x^2 = (1\text{-}10\ h^2 + 9\text{-}10\ h^2)$; adding these we have

$$x^2 = (10\text{-}100\ h^2 + 9\text{-}100\ h^2) = 19\text{-}100\ h^2$$

Or, reduced, $x = 1\text{-}10\ h \sqrt{19}$

Taking $h = 1$ then we have $x + 1\text{-}10 \sqrt{19} = \cdot 43589$, the tabular No at 1-10 semi-span.

It is evident, from the above result, that in any semi-elliptic arch, if one-half the span is divided in the same proportion corresponding with the fractional parts in the Table, the only variable quantity will be the height of the arch.

NOTE—The ordinate at one-fifth the semi-span of any arch, reckoning from A to D, is equal to three-fifths the height of the arch,—and the ordinate at two-fifths the semi-span is equal to four-fifths the height.

EXAMPLE OF THE USE OF THE TABLE.—Given the span of an elliptic arch=36 feet and height B D=12 feet, to find the ordinates.—Now suppose we want 20 ordinates to half the span A D, here we make use of column 20; then

36-2=18 (feet), the half span.

And 18-20=·9, the length of each division.

Now, referring to column 20 and opposite 1, we have the tabular No. ·3123, then ·3123×12 feet the height=3·7476 the ordinate for the 1st division. Again, to find the ordinate for the second division, opposite 2 we have the tabular No. ·4359×12, the height gives 5·2308, the ordinate to the second division; we proceed in the same manner with 1, 2, 3, 4, &c., to the 20th division; then, when we have all the ordinates taken out, we may proceed with the construction. The number of each column represents the denominator, and the vertical numbers 1, 2, 3, 4, &c., the numerators of the fractional parts of the semi-span.

The use of the fractional parts at the top of the table is evident from an inspection of the diagram. For instance, the first division from A to 1 (see diagram) is divided into 1-2, 1-4, 1-8, &c.; then we look in column 20, and opposite these fractions we have the tabular No. ·2222, ·1576, ·1116, then each being multiplied by the height, will give the ordinates at 1-2, 1-4, 1-8, &c., of the first division.

If we should investigate the ordinates to semi-circular arches, we should come to the same conclusion as above; and it may be here stated that the same remarks are applicable to the semi-circular as well as the semi-elliptic arch.

Table of the Ordinates of Semi-Elliptical and Semi-Circular Arches when the Height is equal 1.

Column No. 4.	Column No. 8.	Column No. 5.	Column No. 10.	Column No. 20.	Column No. 40.	Tabular Numbers.
——	——	1-32	1-16	1-8	1-4	·1116
——	——	1-16	1-8	1-4	1-2	·1576
1-16	1-8	——	——	——	——	·1765
——	——	1-8	——	1-2	1	·2222
1-8	1-4	——	1-2	——	——	·248
——	——	1-4	——	1	2	·3123
1-4	1-2	——	——	——	——	·348
——	——	——	1	——	3	·38
——	——	1-2	——	2	4	·4359
1-2	1	——	1 1-2	——	5	·4841
——	——	——	——	3	6	·5268
——	——	——	——	——	7	·5651
——	——	1	2	4	8	·6
——	——	——	——	——	9	·632
1	2	——	2 1-2	5	10	·6614
——	——	——	——	——	11	·6888
——	——	——	3	6	12	·7141
——	——	——	——	——	13	·7378
——	——	——	3 1-2	7	14	·76
——	3	——	——	——	15	·7806
——	——	2	4	8	16	·8
——	——	——	——	——	17	·8182
——	——	——	——	9	18	·8352
——	——	——	——	——	19	·8511
2	4	——	5	10	20	·866
——	——	——	——	——	21	·88
——	——	——	——	11	22	·893
——	——	——	——	——	23	·9052
——	——	3	6	12	24	·9165
——	5	——	——	——	25	·927
——	——	——	——	13	26	·9368
——	——	——	——	——	27	·9457
——	——	——	7	14	28	·9539
3	——	——	——	——	29	·9614
——	6	——	——	15	30	·9683
——	——	——	——	——	31	·9744
——	——	4	8	16	32	·9798
——	——	——	——	——	33	·9846
——	——	——	——	17	34	·9887
——	7	——	——	——	35	·9922
——	——	——	9	18	36	·995
——	——	——	——	——	37	·9972
——	——	——	——	19	38	·9988
——	——	——	——	——	39	·9997
4	8	5	10	20	40	1·0000

HENRY A. JONES, C. E.
Harlem Railroad, New York.

Physical Benefit of the Sabbath.

The Sabbath is God's special present to the workingman, and one of its chief objects is to prolong his life, and preserve efficient his working tone. In the vital system it acts like a compensation-pond; it replenishes the spirits, the elasticity, and vigor, which the last six days have drained away, and supplies the force which is to fill the six days succeeding; and in the economy of existence, it answers the same purpose as, in the economy of income, is answered by a savings' bank. The frugal man who puts away a pound to-day and another pound next month, and who in a quiet way is putting by his stated pound from time to time, when he grows old and frail, gets not only the same pound back again but a good many pounds beside. And the conscientious man, who husbands one day of existence every week—who, instead of allowing the Sabbath to be trampled and torn in the hurry and scramble of life, treasures it devoutly up—the Lord of the Sabbath keeps it for him, and in the length of days the hale old age gives it back with usury. The savings' bank of human existence is the weekly Sabbath.—[North British Review.

Recent Foreign Inventions.

AMORPHOUS PHOSPHOROUS.—The great improvement of rendering phosphorous amorphous, lately discovered by a German chemist, (samples of phosphorous so rendered, were exhibited at the Great Exhibition), has been patented in England, the secret having been sold to a Mr. Arthur Albright, of Birmingham, who, as an introducer, has taken out the patent in his own name. The following is an abbreviation of the specification derived from our cotemporary, the London Mechanics' Magazine.

"This invention consists of an improved method of treating phosphorous, whereby it is rendered amorphous and non-crystalline, and and so far modified in its general character as to be capable of being readily removed from place to place without danger. It is also changed in color, and deprived of much of its poisonous nature and offensive smell and does not ignite under friction or percussion, unless the heat generated thereby exceeds 464° Fah. the point at which amorphous phosphorous is inflammable being 482° Fah.; neither is it so liable as ordinary phosphorous to become converted to phosphoric acid when exposed to the influence of a warm temperature; but when mixed with chlorate of potash, it becomes highly inflammable, and may then be used for the manufacture of lucifers and other similar articles.

These results are produced by the application of heat to ordinary-manufactured phosphorous while access of air is prevented.

The phosphorous to be operated on is placed in a glass or porcelain vessel, inside a closed cast iron pot which has a pipe communicating with a vessel containing quicksilver and water, or water only. The cast iron pot is placed in a sand bath, which again is placed in a metallic bath, to which is applied the heat necessary for conducting the operation. The application of moderate heat causes bubbles to escape from the pipe of the vessel containing the phosphorous, which ignite on coming in contact with the air; as soon as these bubbles have ceased to issue from the pipe, the temperature is raised to about 500° Fah., and maintained at that point until the phosphorous is rendered amorphous. It is then lowered, and the phosphorous allowed to cool, when it is levigated under water, and strained or pressed in filter bags. When dry, it is purified by spreading it in thin dry layers on iron or lead plate, and applying heat, which may be that of steam. In order to remove any ordinary phosphorous which has not been converted to an amorphous condition, and adheres to that which has been operated on, the phosphorous is washed in water, or its removal may be effected by the use of bisulphuret of carbon."

[It is well known that persons engaged in making friction matches are subject to the most dreadful diseases, arising from the use of phosphorous in their manufacture. In Germany and Russia, the poor beings engaged in the making of these matches in the very large manufactories established in those countries, have exhibited a worse than Creten deformity. It is asserted that this discovery removes the evils complained of.

According to the Railway Times, all the railroads now on earth have cost the enormous sum of £447,786,000, or $2,238,940,000.

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NEW INVENTIONS.

Invention for Cutting Butter out of Tubs.

Mr. Nathaniel Woodbury, of Salem, Essex Co., Mass., has taken measures to secure a patent for an invention to cut butter out of tubs, which invention consists in providing a rectangular box having a narrow knife which traverses over one of its ends, said knife being operated by two levers having their fulcra on two of the sides of the box or case. There is a piston within the box having suitable rods, which project through the one end of the box, and by these the piston is operated. The implement is used by forcing the end of the box or case into the butter the required distance, the piston having been previously raised or drawn back, and then operating the levers so that the knife traverses across the end of the box, cutting the butter, and thus detaching the butter that is within the box or case from that which is within the firken or butter tub. The box or case is then withdrawn, and the butter within is forced out upon a plate or salver by means of the piston.

Improved Loom for Weaving Piled Fabrics.

Mr. Samuel Richardson, of Claremont, Sullivan Co., N. H., has taken measures to secure a patent for a good improvement in Power Looms for weaving piled and looped fabrics. The improvements chiefly relate to the peculiar construction and to the mode of operating the pincers which draw and insert the wires, which are placed between the ground and pile warps, for the purpose of raising the loops that form the pile. The loom is for weaving Brussels carpets, and with a loop cutter connected, the velvet piled carpets are produced by it.

Improvements in Fire-Boards.

Mr. Charles Richards, of New Brunswick, Middlesex Co., N. J., has taken measures to secure a patent for an improvement in operating fire-boards, the nature of which invention consists in operating or raising and lowering the fire-board vertically, said fire-board being placed immediately in front of the fire-place, and having balance weights attached to it by cords which pass over suitable pulleys. The fire-board is so arranged as to pass, when raised, between the mantel and a part of the chimney in a recess.

New Smut Machine.

Mr. Thomas B. Woodward, of Kensington, Philadelphia, has taken measures to secure a patent for an improvement in Smut Machines. The machine has a perpendicular ventilating revolving cylinder, said cylinder being formed by securing between two horizontal circular discs a series of vertical fluted columns. In connection with the cylinder, a perforated curb is employed having ribs on its inner surface. The revolving cylinder, with the curb, scours the grain, and a fan blows out the smut and dust. The grain passes from the cylinder in blast spouts where the current of air separates the unclean from the clean grain, which is rendered very clean indeed.

To Prevent Accidents by the Breaking of Railroad Car Axles.

A. L. Finch, of New Britain, Hartford Co., Conn., has taken measures to secure a patent for an improvement to prevent accidents arising from the breaking of axles of railroad car wheels. The improvement consists in enclosing the axles in tubes, so that when an axle breaks it will be prevented from dropping down and working loose.

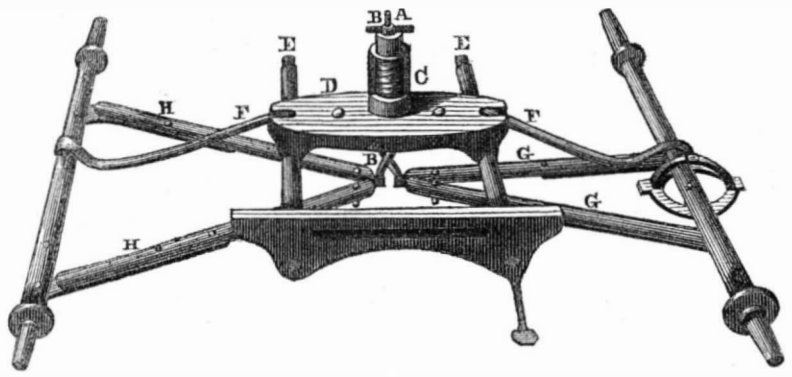
Wilson's Stone-Dressing Machine in Tennessee.

A company has been formed in Nashville, Tenn., which has purchased the patent of Wilson's Stone Cutting Machine, which has been illustrated in our columns. They have purchased a quarry and are about to commence operations on a grand scale. We are glad to hear of this.

Magnetic Forces.

Prof. Faraday delivered a lecture before the Royal Institution, London, on the 23rd ult., on a method of measuring the force of magnetic powers with precision and certainty. He cited the general law, that the magnetic action is inversely as the square of the distance, but this did not hold true for very small distances. By passing a horizontal needle about a magnet from one pole to the other, he showed that at every point it formed a tangent to the curve If iron filings be strewed about a common cylindrical or rectilineal magnet, they will assume the form of curved lines abutting on the magnet at each end, and having their greatest distance from it in the production of a line through the equatorial axis. If a metallic wire be laid along in the direction of these lines there will be no electrical action, but if laid across these lines either perpendicularly or obliquely, a current of electricity will pass, and this current can be measured precisely by the Galvanometer. He considered the earth as one great source of magnetism, and assumed that the magnetic lines of 62° enter the globe, and make a complete circuit, the direction of them being shown by the vertical dip of the needle. He asserted that if this were so, magnetic action would be displayed, if these lines were intersected. By his experiments he demonstrated that this was the case.

IMPROVEMENT IN HANGING CARRIAGE BODIES.



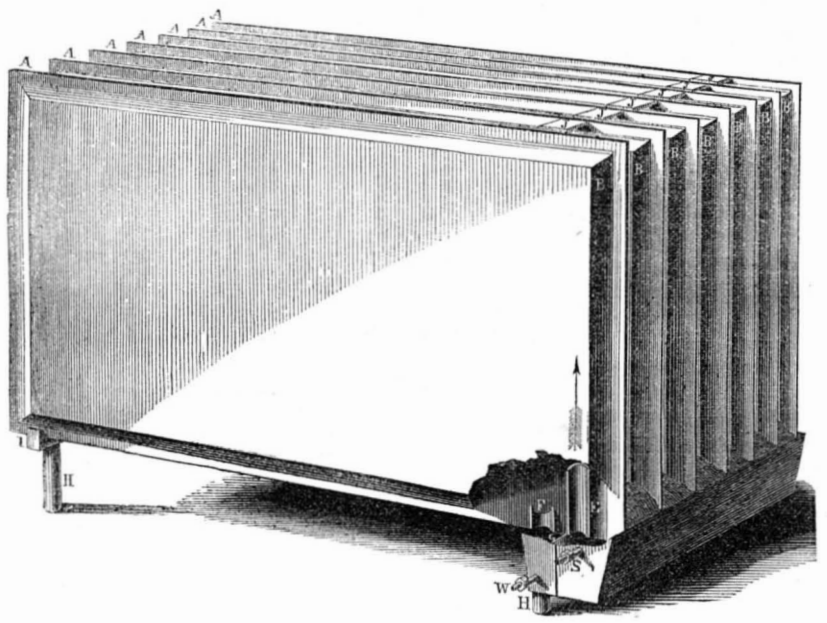
The accompanying engravings illustrate an improvement in Hanging Carriage Bodies, which was patented on the 22nd day of last July, by the inventor, Mr. John Jones, of Clyde, Wayne Co., N. Y., the inventor of the machine which printed the letter on page 166, this Vol., Scientific American.

A is a handle nut; B is a rod passing through the spring, C, and attached to the bars, H H and G G, the upper end passing through the nut, A, by means of which the body is raised or lowered and the strength of the spring graduated. D is a bar on which the lower end of the spring rests; the ends of the bar resting by suitable bearings on the cross bars, E E, secured to the bars, H H and G G, these being attached by joints to the hind axletree and fifth wheel; the stays, F F, are attached by joints to the bar, D, and the upper side of the axletree; I is a malleable supporter or hang-iron which is bolted to the body, having on its back or inside sockets fitting on the cross bars, E E. The guard-iron and step form a part of this casting. The centre of the bars, E E, and the joints where the stays, F F, are attached to the bar D, are equal distances apart with the joints above and below the axletrees, which keep the lower bars and stays, F F, parallel with each other; and also keep the axletrees in their true set whatever may be the weight in the buggy or position of the body.

Thus a light, cheap, and strong arrangement is produced, and the stationary reach and heavy springs dispensed with.

Any information respecting the manufacture or interests in the rights, can be obtained by addressing the inventor, or A. T. Soule, Agent, Clyde, Wayne Co., N. Y.

HEAT RADIATOR, AND CONDENSER.



The accompanying engraving is a perspective view, with a small portion of the shell removed, of the apparatus of Mr. A. S. Lyman, of this city, for heating apartments by steam, and for an exterior condenser for steam engines.

A B is a flat box radiator, composed of a number of narrow metallic chambers formed of thin plates; S is a steam chest; E is a passage from this chest to the radiator, to admit the steam from the exhaust pipe of a steam engine, or steam from a boiler; F is another passage to carry down the water formed by the condensed steam, which is produced by the radiation of the heat. This keeps the radiator free from water; W is a water receptacle; J represents braces fastened to one radiator chamber, A, and sliding on the other. They are placed in the spaces, B. Being so placed they allow for the expansion of the metal. H H are legs of the apparatus. The steam pipe enters a steam box, and passes into each chamber, A, by a small pipe, and the water pipe is connected with a similar box to take off the water in a similar manner to that by which the steam is admitted. The steam and water passages are not subject to be thrust out laterally, nor are the joints subject to be strained by any expansion. I is a guide to retain the joints in their proper position. The radiators are made of any size, either of sheet iron or 14 oz. copper sheating. Each chamber is placed within half an inch of the other. 16 radiator chambers occupy a space of only 12 inches wide. In one cubic foot of space there are 32 superficial radiating feet.

The steam passes from the boiler, or exhaust, into the chamber by the pipe, S, and upwards by the passages, E (one shown), as indicated by the arrow. The condensed steam being heavier passes down through the pipe, F. The whole radiator chambers are filled and heated with steam before any steam escapes by the passage, F. The room in which this apparatus is placed is heated by the air, which absorbs the heat from the metal, then rises as it is rarified, and its place is supplied by a continual current of the colder air, until the room is of a very pleasant temperature.

We have one of these apparatus for heating our office; the steam being supplied from the exhaust pipe of the steam engine belonging to the establishment of the New York Sun, which steam, before it was thus applied, passed out as waste to the atmosphere. The radiator occupies but a very small space, but it exercises a potent influence, with a small quantity of waste steam, to heat a very large space. The unequal expansion of the joints of radiators has been a frequent source of trouble heretofore; this evil is obviated in this radiator.

This radiator can be put into a chimney in place of a grate, and it can be made to look quite ornamental. It is used by Mr. Lymar, in his own house, the steam being generated by a common boiler placed on a kitchen range. It can be put up and maintained at a very small expense, and can be used by every family. Rooms up stairs can be kept warm by the waste heat from a cellar kitchen, without any danger, for the steam used is all low pressure.

This steam heat radiator may also be employed as a condenser for steam engines, to return the condensed steam as pure distilled water, by the application of salt water on the outside, thus making it a water regenerator, very valuable for steamships. Four feet of surface is required for each horse power with the average temperature of the applied water at 90° below the steam (132°). The box is totally immersed in the water, and the pipes, S and W, made as large as the exhaust pipe of the steam engine. The water pipe is turned down after it leaves the condenser and enlarged or made of considerable length, so that its cubical contents equal one half or more than one half the cubical contents of the cylinder.

In many places the water is very illy suited for steam boilers, as it forms incrustations very rapidly in the inside of boilers; in such places a condenser may be exceedingly suitable, to feed the boiler with pure water, by using the hard water only for condensing the steam inside of the condenser. Respecting the qualities of this apparatus as a radiator, we have had ample experience, and can speak in very favorable terms about it.

More information may be obtained by letter addressed to Mr. Lyman, at Brooklyn, N. Y.

Perpetual Motion.

After years of mathematical labor and mechanical results, Prof. Willis, of Rochester, has completed, and has now in constant operation, a self-winding clock, which determines the seconds, minutes, hours, weeks, months, and years of time with unfailing accuracy, continuing in constant motion, by itself, never requiring to be wound up, never running down, but moving perpetually so long as its components exist. So says the Rochester Democrat, but many such clocks have been invented. In pure mathematics there is no friction, but in mechanics there is. If Prof. Willis has made a machine, which operates without friction, then he has made an ever-going clock, and therefore its *parts* will never wear out; the wearing of parts is a sign of friction, consequently it will stop some day.

Writing Machine.

The Aberdeen (Scottish) Herald states that a Dr. Dewar, of that city, has invented a machine, at one end of which reporters' short-hand notes are placed, and at the other end of which, a few yards off, they are produced at the ordinary rate of speaking, in clear, bold, long hand, ready to be put into the hands of the printer.

The said paper has printed a speech which was written out by this machine, and says that four columns of the London Times may be produced, comfortably, in a couple of hours, by one reporter; whereas, under the present laborious and cumbrous plan, nearly eight hours would be consumed in the task by an ordinary reporter.

The propeller steamship S. S. Lewis has been sold for $150,000.

The only way to encourage improvements in the arts and sciences is to afford full protection to every man for his improvement.

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Scientific American

NEW-YORK, FEBRUARY 28, 1852.

Steam Navies.

It appears that some of the English newspapers have got into an awful agony about the invasion of old Albion by Bonaparte the Second. Many of our newspapers, and some of our orators, have also descanted tremendously upon the subject. It has even been said, by some of them, that the despotic powers of Europe might unite together, make a descent upon England some fine morning, with an army of whiskered pandors and fierce hussars, and, after Frenchifying and Russianizing her, eating up all John Bull's roast beef, and supping up all Sandy's kail brose, would make direct for Manhattan Island or Chesapeake Bay, and soon make short work with our Republican Johnny-cakes and hommony. They really appear to be afraid of our Model Republic, —afraid that the despots will submerge England and then swallow up our continent, Bunker Hill and all that. It is really grievous to us, whose hours are so often taken up in plowing through statistics and acquiring unassailable facts, to see so much ignorance displayed by many of our distinguished countrymen in respect to foreign powers. All the powers of Europe united, could not make an impression upon our coasts, if we except England with her tremendous navy. If they should come here, we would give them a welcome, and a grave beneath the waters of our seas, before they could set foot upon our shores. It appears to us that the people of England, who are making such an ado about being invaded from France, are not well acquainted with the power of their own country. The navy of England is the largest in the world, and next to her in power is that of the United States.

By the recently published report of the Secretary of our Treasury, it is stated, that we have of steam vessels, 1391—some of them steamships of great power; and the Collin's line of steamers, are the largest in the world; they can be turned into war vessels in a very short period. We have 96 marine steamships, 15 of which, compared with 15 of the largest belonging to England, exceed them by 5,000 tons; and then to these we can add 382 steam propellers, some very fine and large ships. France and Russia combined have not a steam mercantile marine equal to ours; and as for the other powers on the continent of Europe, their steamships are about as numerous as dromedaries on our prairies. At the present moment there are, in the New York docks, five or six new steamships, of the largest class, almost ready for sea. Our steam marine is now very powerful, far more so than we are liable to suspect: it has grown up, as it were, "in a single night."

The inland steam ships and boats of the United States number 766; the tonnage of these, in the aggregate, amounts to 204,6I3 tons; the tonnage of our marine, amounts to 212,500 tons—total 417,113 tons. Our mercantile steam vessel tonnage is the largest in the world. Our government navy, however, is exceedingly small, and of no great strength, but with it and the mercantile new steamships, which can be easily transformed into powerful war vessels, we have not the least occasion to fear the united forces of all the despotic powers of Europe; our pancakes are safe, and if we do not destroy our own liberties, we have no fears of them being destroyed by foreign powers, even although England was Frenchified and Cossackized to-morrow.—But there is a most lamentable general ignorance of the power of England, both among the people there and our people here. This we judge from the statistical facts respecting her steam navy and mercantile steam marine. Her steam navy is really terrific: being no less than 147 vessels, besides three new 80-gun propellers ready to be launched. One half of these, only, are in commission, but then she has 75 steam vessels, ready for war at any moment, the average tonnage of which is 800 tons each: some of them are very small and some very large, but the very smallest is fit to cross the Atlantic. The commercial steam marine of Britain numbers 1184 steamships and steamboats: the city of London alone has 333 steam vessels, with a tonnage of 102,000 tons. The city of Glasgow has 88 steamships, all fitted for sea, with a tonnage of 34,000 tons. In Liverpool there are 99 steam vessels with an average tonnage of 21,059 tons. Thus, in three ports, there is a tonnage of steam vessels amounting to 157,059 tons. There is a statement in the last Franklin Journal making the merchant steam tonnage of Great Britain to be only 142,080 tons. It is right that we should be well informed about the power of foreign countries. It is our opinion that the policy of England always has been to hide her strength. It may be wise policy, and it may not—we have no occasion to discuss that point now, we only wish to present facts, for true information to our people. We have presented the tonnage of the steam vessels of three British cities, and we have rather under-rated it. If we allow an average tonnage of 200 tons to all the mercantile marine there, it will amount to 236,400 tons.

We have seen a statement in the Cincinnati Gazette, about so many English steamboats being below 100 tons burden, and that we had no such class here. This is true, but every one of them are under-rated; and for all, the very smallest is fit for sea. One single Glasgow Company (the Cunard), has seven Atlantic steamships with a tonnage of 13,100 tons, and this force is to be increased about 6,000 tons. There are at least 100 steamships of 1000 tons burden, each of which, upon an exigency, could be drafted into the British navy, and, in a few days, armed and equipped, not for defence, but offensive operations. The statements that England may be invaded from France, is all sponge cage and Cologne water. Whenever her dockyards are active all the European powers shake; they are vulnerable to her. She is able, in two weeks, to blockade all the ports of Europe, and defend her own at the same time.

These are our views on the subject, and the conclusion which we draw from them is, that our navy should be increased with four or five new steamships of the first class, as soon as possible, not for fear of the Cossack or Frank, of Europe, but to protect our fast-growing trade on the Pacific.

History of the Re-Issue of the Woodworth Patent.

It is well known that a re-issue of the patent of William Woodworth, for improvements on Planing Machines and for tonguing and grooving planks, was passed by the Patent Office on the 8th day of July, 1845, but it is not generally known how that re-issue was brought about, nor the history of the agents as connected with that affair and the Woodworth Patent. In December, 1828, William Woodworth obtained his patent, and it was renewed for fourteen years, once, by special Act of Congress, for the benefit of Woodworth's heirs and executors, after its first term had expired (Dec., 1842). Two years after the Act to extend it had passed, and five years, we believe, after the inventor was dead, namely, the 18th June, 1844, the son of the inventor, W. W. Woodworth, surrendered (as is the custom to do when re-issues are applied for) the original patent, and prayed the Commissioner of Patents, H. L. Ellsworth, Esq., to re-issue it in three distinct patents, for so many combinations,—never claimed by old Mr. Woodworth, —that is, to make three patents out of the old one, embracing claims not sought for in the original patent. Dr. Jones was the agent in this affair; Mr. Ellsworth refused, and said if he was *urged to a decision*, he would *decide against it*, and withhold the patent. The application and old patent were then hastily withdrawn. Mr. C. M. Keller was then the Chief Examiner, and he it was who examined the application, and, as was his duty to do, he no doubt wrote the letter of refusal, which Mr. Ellsworth signed. After Mr. Ellsworth was superseded by the Hon. Edmund Burke, on the 5th of May, 1845, Mr. Keller resigned, and Mr. Fitzgerald, his assistant, was appointed in his place. Mr. Burke being absent in New Hampshire, Mr. Keller, who had become a patent agent, presented, on the 7th July, two months after he resigned, an application for the re-issue of the Woodworth patent. This application was examined, passed by Mr. Fitzgerald, enrolled upon parchment, and signed, in one day—the next after it was presented. Mr. H. A. Sylvester was the acting Commissioner of Patents, who knew nothing about Mr. Ellsworth's decision, nor the previous history of the patent; and neither Mr. Keller nor Mr. Fitzgerald, as it was the duty of the latter, especially, to do, gave him the least information on the subject. The re-issued patent is the one now used in our courts as the invention of William Woodworth, and it is the one sought to be extended by the present Congress. It will not expire until Dec., 1846. The claims are entirely different from those of the original patent.

This history, we have obtained from a pamphlet by the Hon. Edmund Burke, ex-Commissioner of Patents, who was not himself acquainted with them until he left the Patent Office, and was employed, in the course of his profession, to examine the Records of the Patent Office, in relation to the re-issued patent.

This strikes us as being one of the most extraordinary transactions that we ever heard of being perpetrated by Government officials in any country. It should be rigidly investigated by the Patent Committees of the Senate and House of Representatives. In view of these facts, there is but one course open, we think, to the gentlemen composing these committees, and they do not require us nor any other person to tell them what it is.

Mind your Business.

It is really vexing to us to read, as every man should, some of the speeches of our Senators in Congress. We have read the remark by two of our Senators, at least, stating that however much they sympathized with the oppressed nations of Europe, they never would join in an alliance with tyrannical England. All right. Has such an alliance been proposed? We have not been able to come across any account of the proposals. It would be well for people to stick to their legitimate business—discuss the affairs of their own country: "mind their business," that's their duty. In looking over the Resolutions that have been introduced into the present Congress, we really feel ashamed of the conduct and ignorance of some of the honorable gentlemen in both branches, but more especially do we feel chagrined at the impertinent interference in the affairs of other nations, to the neglect of our own. A resolution is introduced about interference in the affairs of other nations, and, lo-and-behold! a dozen long speeches are made, every one travelling round about European history, and ending without the least resemblance of anything like "minding your own business." Another introduces a resolution about Exiles from Ireland, and lo! as many patriotic speeches are made, and not a soul of them can tell anything about the facts of the case. Many of our Senators, men with a reputation for law knowledge, are exceedingly ignorant of the laws of foreign countries, and with this ignorance they have the foolish habit of "not minding their own business." We see a necessity for speaking thus, for while we see flaming patriotic speeches made about liberty, tyranny, &c., the important business of American patents is but merely noticed in the telegraphic reports. It is a shame to our country, that our Senators and Representatives should pay so much attention—and all of no use whatever—to discuss business quite foreign to their legal duties, and neglect the important concerns of their own country. Gentlemen, will you take Franklin's advice, "mind your own business." Look into the Patent Law strictly, and see if it requires to be amended, and if it does, do it quickly. Look into the question of extending the Woodworth monopoly, and see if the application for it does not require some of the invective so freely dealt out to the governments of other nations.

Communication through the Lakes with the Pacific.

Capt. Synge, of the English navy, has read two papers before the Royal Geographical Society, on opening up communication between the Atlantic and the Pacific, through the St. Lawrence and the Great Lakes. Sir Roderick Murchison thought it could be done, and compared the project to the uniting of the Black Sea and the Baltic, by Peter the Great of Russia.

Glass Dials for Public Clocks.

A new glass dial has been furnished for the City Hall clock, in the Park; well, there was much need of it. The new one is in one piece, transparent, without the dark seams that disfigured the old one, and which rendered an eye-glass somewhat necessary to distinguish the hands. The great benefit of glass dials for public clocks, is the rendering them transparent, so that when a light is placed inside, the hours can be distinguished at night as well as by day. The constructors of the dial were Messrs. Sherry & Byram, of Sag Harbor, Long Island.

We learn by "The Corrector," of Sag Harbor, L. I., that Messrs. Sherry & Byram have completed new glass dials for the clock in the City Hall of that village. Each dial is 7 feet in diameter, and made of one piece of glass, with the figures and minute marks of metal, secured to the glass by screws.

The Common Council of this city, we have been told, have contracted with the above gentlemen, for a new clock, for the cupola of our City Hall, which is to be warranted not to vary two minutes in twelve months. It is to be a chronometer clock.

We are glad to see that transparent dials are becoming more common on public clocks. Every village should have one clock with a transparent illuminated dial. In any place where gas is employed for public illumination, it is so easy, and costs so little to maintain a light in a transparent dial, that we have no excuse for any village, town, or city, which does not maintain one. Before we had an illuminated clock in this city, we directed attention to the subject a number of times. Our remarks, we believe, did not fall like water on the flinty rock; and we hope the few we have now made will have some effect in extending the application of illuminated dials to all public clocks throughout our country.

Walking Like a Fly Head-downwards.

A Mr. McCormick has been rather astonishing some of the New Yorkers, during the past week, by walking on a polished marble slab, head-downwards, in one of our amphitheatres. It is somewhat frightful to see a fellow mortal perched up in mid-air, with his head to the ground—but a long way above it—and his feet to the roof. It is the first feat of the kind ever performed, so far as we are aware, and McCormick has been dubbed with the title of Professor, for his scientific performance.

The feat is performed upon well-known principles of science, by using air pumps, and working them step by step, to extract all the air under appendages on his feet, so that the outward pressure on one foot will exceed his whole weight. If he is 150 lbs. weight, it requires 10 square inches of atmospheric pressure to balance that, for the atmospheric pressure is 15 lbs. on every square inch of the earth's surface, therefore $10 \times 15 = 150$ lbs. This pressure must be on one foot, while the other is being moved forward. The courage required to perform the feat is not small, and the labor is very severe and tedious. It is needless to say, that although the polished marble slab is the greatest wonder to some, he could not perform the feat on rough porous boards.

Ventilation.

On our proper page there is an advertisement of Henry Ruttan, Esq., of Coburg, Canada, to which we wish to direct attention. He is desirous of an opportunity of superintending the erection, with his system of ventilation, of a good dwelling or school house in this city (New York). Our people should pay attention to this subject.

We learn from the Aurora (Ia.) Standard, that ground was to have been broken, and active operations commenced, on the Ohio and Mississippi Railroad, opposite St. Louis, on Monday, 2nd inst.

The ceremony of breaking ground on the Ohio and Mississippi Railroad took place at Illinoistown on the 7th inst. There was a very large attendance.

A train of six cars, on the Georgia and Central Railroad, took fire on the 12th inst., and were consumed with all their contents, consisting of two hundred and fifty bales of cotton.

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LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING FEBRUARY, 17, 1852

GRATE BARS FOR FURNACES—By Francis Armstrong of New Orleans, La. Ante-dated Aug. 17, 1851 : I claim the form and construction of the grate bars for furnaces, having jogs, in the blade of the bar, extending from the lower line or edge of the bar, up to the level of the lower line, of the extension through the fire front, thereby securing the advantage of having said grate bars held permanently in their required position, by the said jogs touching each other, and, at the same time, leaving all that section of the openings above the jogs, free for the admission of a poker between the bars, to remove any solid matter produced from the combustion of the fuel.

PUMPS—By Abel Barker, of Honesdale, Pa.: I claim the combination and arrangement of the two barrels and the pistons, in such a manner that the water shall flow down through the lower barrel, and up through the upper barrel, thereby enabling one piston to act in descending and the other in ascending, for the purpose of producing a constant flow of water, substantially in the manner described.

I also claim the peculiar construction of the lower piston, by which its valve allows the water to pass downward, and closes by its own weight, either with or without magnetizing, substantially in the manner described.

EXPLOSIVE COMPOSITIONS FOR BLASTING ROCKS —By Edward Callow, of London, England. Patented in England, Aug. 6, 1850: I claim the explosive compound described; but I would have it understood that some of the materials mentioned as component parts in my improved explosive compound, have been used before by pyrotechnists and others, in the manufacture of various fire-works, and that, as regards such use, I do not claim anything in my invention, except so far as regards the combination I have given and for the purposes mentioned.

The shape and material of the cartridge cases have nothing to do with invention, they being optional with the party using them. I have only given drawings of and described what I have found to be the most convenient for the purpose.

FENCES—By John Card, of Gainesville, N. Y.: I claim the construction of the posts in pairs, and their combination with the rails, in such a manner as to render the fence strong and firm, by balancing the weight of the fence, by its construction as described, upon each side, equally, of the centre of each pair of the posts, and securing, at the same time, the advantages of a straight fence, and of posts standing upon the surface and secured from decay.

I do not claim the construction of the posts, as described, either singly or in pairs, but the combination of the advantages mentioned, as described.

RAILROAD GATES—By E. P. Carter, of Yorkshire, N. Y : I claim the method described for balancing a railroad or other gate, viz., by means of a spring coiled around a stationary axis, to which it is attached by one end, the other end being attached to the disc that forms the hub or centre of the gate, turning on said axis, substantially as described.

I also claim the use of the rock shaft provided with the cam ledges and straight ledge, to be operated upon by the wheels of the passing train and the cams for winding up the chains which draw up the gates, the whole being arranged in the manner and for the purpose substantially as set forth.

CHAINS—By J. M. Crawford, of New Castle, Pa. : I do not claim to be the original inventor of the combination of the parts, movements, and operations, in one machine, which are required to make jack chains by one process, from straight wire, after it is cut off into suitable lengths, to the finished chain.

Nor do I claim the stud pin with a recess in it as a mandrel, around which the bow of a link is bent, while the bow of another link is held in the recess, thereby forming a continuous chain.

Nor do I claim a partly revolving mandrel, with a stud pin and nipper, and other appendages for bending the last bow of each link, as combined, used, and constituting part of a machine already patented.

But I claim, first, the combination of the welding dies with the swage, for welding or uniting the lapped ends of the link, and dropping the latter upon the suspending arm, the advance of the die moving the link to the face of the swage, where the operation of welding is performed.

Second, attaching the vibrating arm to the bed of the die, and operating the same, in such manner as to receive the finished link, and suspend the same in a position to be seated.

Third, the combination of the slide bar, turning lever, and cross bar, constructed and arranged as described, the said bar and lever operating to turn and push the finished link into its seat.

Fourth, the link seat attached to the lever beneath the swage for receiving the finished link from the suspending arm, and holding the same, until the wire, or rod, for the succeeding link, is fed into the finished link, cut off, bent and ready to be welded.

Fifth, the employment of the curved holding lever attached to a lever, in combination with the pendant cam bars (two) short pendant arms (two), the pin and spring bar, constructed, arranged, and operating as described, whereby the finished link is held in its seat and liberated therefrom, simultaneously with the advance of the die, to finish the succeeding link.

Sixth, the combination of the spring bar, with the shear cutter, whereby the pendant cam bars are attached through the pin and springs (two) to hold or relieve the arm from the seated link, as described.

Finally, I claim making the grooves in the bed dies slightly oblique to their faces, for the purpose of canting the ends of the rod or wire, so as to allow them to lap when bent by the levers, as described.

BRAN DUSTERS—By Lewis Fagin, of Cincinnati, Ohio: I claim, first, the arrangement of the vanes in the blast cylinder, substantially as described, whereby I attain a free escape for the blast, and effectually prevent the accumulation of flour within the blast cylinder, and thus keep the cylinder truly balanced on its shaft or axis.

Second, the insertion of vertical rows of beaters on each rib of the bolting cylinder, and on the vanes of the blast cylinder, from top to bottom, for the purpose of beating the offal at each successive rib and vane, and preparatory to each jet of blast, substantially as described.

BRAN DUSTERS—By Abel Hildreth, of Newark, O.: I claim the arrangement and combination of the several parts of a bolt or bran duster, in such manner that the draft generated by the rotation of the beaters within the bolting screen, shall act as a conveyor or elevator, for the purpose of transferring the bran or meal, from any portion of the mill, to the bolting or dusting apparatus, and shall, at the same time, cool the bran or meal thus conveyed.

I also claim the scouring apparatus described, consisting of a series of pairs of toothed discs, arranged in vertical order above each other, at such distances apart, as will admit of the free passage of the meal, or bran, between them, alternately from the centre to the periphery between the discs of each pair, and from the periphery to the centre between the pairs of discs.

I also claim the method described of shielding the current of mixed air and meal or bran, from the centrifugal action of the revolving discs, by means of stationary diaphragms, arranged as set forth.

STOP MOTIONS OF LOOMS—By Lora B. Hoit, of Millbury, Mass.: I claim, first, the forked lever and spring, constructed and arranged substantially as described, in combination with the pins (three) and slide, to release the slide when the weft is properly drawn across the pins, and to traverse it to stop the loom, when the shuttle ceases to draw the weft across the said gird.

Second, the spring or its equivalent, to stop the prongs of the lever and raise the catch so as not to stop the loom when the shuttle is in the box at the opposite end, the parts being arranged substantially as described.

METER FOR STEAM BOILERS—By W. H. Lindsay, of New York City : I do not claim the special use of a plunger, piston, or pistons, poppet valves, or well known cocks, the same being long known and used; but I claim the means set forth for maintaining the feed to the boiler, etc , and the closing or cutting off the communication to and from the meter, in case of accident, or from other causes, arranged and operating as described.

STEAM BOILERS—By James Millholland, of Reading, Pa.: I claim the contracted grate, in the fire-box, in combination with a supplementary chamber of combustion, supplied with air, and situated at a point intermediate between the fire-box and smoke-box, which is connected with the former and the latter by flues, in the manner described.

GRAIN AND GRASS HARVESTERS—By R. T. Osgood, of Orland, Me.: I claim the manner of placing the toggle joint purchase (with the transverse acting joint), upon the end of the cutter arm, to act in conjunction with the other machinery, giving it, as it were, a double purchase, by hanging the sweep, so that the arm of the crank will be horizontal or parallel with the toggle joint, when straight, and giving the cutters its double motion, by acting above and below this line. When the crank or hand is up, the purchase is at the upper end of the sweep, when half way down, it is at the lower end or joint, varying like a circular or screw power.

FEEDING APPARATUS FOR A GRAIN THRESHER— By Wm. R. Palmer, of Elizabeth City, N. C.: I claim the method described, of preventing accidents to the feeder of a threshing machine, by interposing between him and the cylinder, a roller, or the equivalent thereof, which is arranged across the throat of the machine, and is supported and guided, substantially as set forth.

BANDING PULLIES—By R. W. Parker, of Roxbury, Mass.: I claim arranging the driving pulley in reference to two other pulleys, that the band passing over these pulleys is not only pressed with any desired force against the periphery of the driver, but is also pinched betwern four other pulleys, they operating upon the band as feed rollers, substantially in the manner described.

CAPSTANS—By Peter Robertson of New York City : I claim the combination of the following mechanical elements, viz., the vibrating tumblers, acted upon by handspikes, the slide, with its racks, the cog wheels, (two, one of which is formed with ratchet teeth), the rathet wheel and its hollow shaft, the pawls (two) the whole arranged within the base and with respect to each other, and acting substantially as described.

ROTARY CULTIVATORS—By P. E. Royse, of New Albany, Ind.: I do not claim any of the parts separately considered, or irrespective of the manner, or form in which I propose, in combination, to apply them, to produce the advantages specified. I claim the construction of the teeth on the main or driving wheels, of a chisel-formed bevel, that is to say, one face being a continuation of the line, or plane, of the radius of said wheel, while the other face is bevelled, to meet it at an angle somewhat less than forty-five degrees, for the purpose of striking into and taking a firm hold of the ground, in the manner set forth.

WEIGHING MACHINES—By Wm. & Thos. Schnebley, of New York City : We claim the employment of the method or methods of securing the lever or levers, connected with the platform by means of a stop or brake, to hold the platform, substantially as described, when this is combined with the pendulous scale or balance, and the apparatus for registering the extent of motion of the said pendulous scale or balance, substantially as specified, by means of which combination we are enabled to register, accurately, the weight of bodies that roll or slide, or are thrown on to the platform, and prevent the apparatus from registering, in addition to the actual weight, the momentum of the descending weight of the body to be weighed.

And we also claim the employment of the mechanism which registers the number of weighings, substantially as specified, when this is combined with the pendulous balance, or its equivalent, and its register, for registering the sum of the weights weighed by the pendulous balance, substantially as described, whereby an accurate register is kept, not only of the number of articles which have been weighed, but also of the whole weight of what has been weighed, as it is often important to ascertain, not only the sum of the things weighed, but also the number of articles which make up that sum.

SPOONS FOR ADMINISTERING MEDICINES—By J. C. Taylor, of West Liberty, Ohio: I claim the particular construction of my spoon with a sliding bottom, and a piston slide, exactly fitting the cavity of the spoon, and the sliding rod, so arranged, that it may be slid in the same moment that the slide tongue or bottom, is drawn out, thereby quickly emptying the spoon of its contents.

I do not claim that my spoon should be a graduating or measuring spoon, but merely for administering medicines already graduated by a physician.

I claim, also, that my spoon will secure, from its arrangement, the advantage of preserving the teeth and administering all the medicines graduated by the physician—a difficulty often experienced in treating children.

[Well what next after this?—just think of a patent spoon for supping castor oil.]

DESIGNS.

LADIES' HAIR COMBS—By Jas. Blackman & Chas. Skidmore, of Newtown, Ct.

GRATE FRAME AND SUMMER PIECE—By James L. Jackson, of New York City.

Petitions for Extension of Patent.

DYEING.—On the petition of Patrick Magennis, of Paterson, N. J., praying for the extension of a patent granted to him for an improvement in the art of Dyeing, for seven years from the expiration of said patent, which takes place on the twenty-first day of April, A. D. 1852.

It is ordered that the said petition be heard at the Patent Office on Monday the 19th day of April next, at 12 o'clock, M.. and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted. R. C. WEIGHTMAN,

Acting Commissioner of Patents.

SPARK CATCHER.—On the petition of Wm. T. James, of New Rochelle, New York, praying for the extension of a patent granted to him for an improvement in Spark Catchers, for seven years from the expiration of said patent, which takes place on the 13th day of April, 1852.

It is ordered that the said petition be heard at the Patent Office on Monday the 12th of April, next, at 12 o'clock M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extensions are required to file in the Patent Office their objections, specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing, must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

THOS. EWBANK, Com. of Patents.

For the Scientific American.

Wooden Boxes for Machinery.

Mechanics are often called upon to run machinery at such a distance from a furnace or machine shop, as to make it very inconvenient and expensive to go to such places for light repairs, and under such circumstances I have not unfrequently been asked, "what kind of wood is the best substitute for metal boxes for light machinery, with rapid motion?"—Perhaps I may usefully serve some one in such circumstances by giving a little of my observation and experience on the subject. From what I can learn from the testimony of others, and from my own experiments, I am satisfied that *fustic* is the best substitute for metal, and I incline greatly to the opinion that it is superior to most, if not all kinds of metal, as an anti-friction substance.

A few years ago I was employed to build a saw-mill under the above-mentioned circumstances, and having a large block of fustic at hand, I made all the principal boxes out of it; it was moved by an over-shot wheel, with the segments bolted to its rim, consequently the end of the drum shaft, to which the pinion was attached, rested on its journal close to the edge of the wheel, so as to be constantly wet. After the mill had run almost uninterruptedly for two years, I examined the box in which this journal ran, and although it was connected with the descending side of the wheel, and sustained all the weight or pressure of the water, still I could not perceive that it had worn one-sixteenth of an inch, and all the other boxes, including those of the crank shaft, were in a similar condition; on these oil was used; I have since ascertained however, that tallow is better.

About two and a half years ago I had occasion to repair a smut machine; on examining which I found that half of the box, against which the journal bore, worn out; and the journal, which was about three inches long, worn away at the upper end to about one-fourth an inch less than at the bottom, and much ridged the whole length of it. The proprietor of the mill being unwilling to stop it long enough to have the journal fitted up, I put in a box of fustic, which is still in use. A few days ago the miller informed me that for a year past it had not worn sufficiently to need drawing up, nor had it heated any during that time, although the machinery is calculated for two thousand revolutions per minute, though I presume it does not come up to that speed; in this box tallow is used. I have frequently used boxes of this kind for circular saw arbors, and have invariably had less trouble with them than with any other kind, either of wood of metal. J. C.

Elmira, N. Y.

TO CORRESPONDENTS.

J. A., of N. Y.—Your ideas about the passing of the oxygen through the pores of the metal, to be mixed with the hydrogen, is new, but we do not see how this could really take place. When water is deprived entirely of its atmospheric air, and heated to 300 degs., it all flashes at once into steam—this is a new discovery of Faraday's, and explains, we think, the cause of many explosions.

J. F. H., of N. Y.—Jewellers' lathes are made in this city by James Stewart, 106 Elm st.; they are operated by crank and treadle. We have sent you the patent laws and some specimens. We are glad your youthful mind finds good food in the Sci. Am.

T. B. W., of Ala.—If you have been a careful reader to the Sci. Am., you must have received all the information you need concerning the treatment of saws.

C. B., of Va.—The time is approaching, undoubtedly, when most of our dwellings will be lighted by gas generated from the fuel used in cooking purposes. We are of the opinion that gas enough escapes from a common cooking range to light an ordinary residence, and we think there is a fine field open for an invention of the description you suggest.

"A Down-East Yankee," Mich.—Many overshot water wheels have been made having buckets which retained two-thirds of the water, when their mouths were at an angle of 45 degs. below the shaft. See plate II., Vol. 4 (plates) Reese's Encyclopedia.

J. N., of Wis.—Your letters on the Inventor's Institute are well written; it does not appear that you are aware of two such Institutes having been organized in 6 years, and under favorable auspices. Both have failed owing to jealousies of the members; your letters would do no good; this we know, but they show that your heart is right on the subject.

W. W., of Washington—It will undoubtedly be an object of importance to have your invention illustrated in our columns: it will reach the right class. $1 received for the Sci. Am.

J. C. O, of N. J.—There have been quite a number of oval compasses invented; we do not know but yours may be like some one of them. We suppose you can purchase one at any of the mathematical instrument makers.

S. M. C., of Mass.—We regard both of your inventions as new and patentable. You can make them for two years without invalidating your right to a legal patent, although it is not always safe to do so. If you find they are likely to sell well you had better make your application for a patent.

J. B. W., of N. C.—We have carefully examined yours of the 12th inst. You will find essentially the same principle as you claim embraced in the pumping engine, illustrated and described in No. 1, Vol. 3, Sci. Am. The difference in the construction is not the proper subject of a patent.

C. J. B., of N. H.—If you will drop a note to the Member of Congress from your district, requesting a copy of the Report, he will send it to you if it can be procured. They are public documents, and not to be found at bookstores.

R. J., of N. H.—There is no necessity of making the model of the same material which you would use in constructing an operating machine; it may be made of any material which will properly represent the principles of the invention.

G. W. D., of Vt.—We will send you a Minifie's Drawing Book by Express, on receipt of $3.

Money received on account of Patent Office business for the week ending February 21.

F. N. C., of Ill., $30; L. D., of Ct., $20; D. & K., of Pa., $20; A. L. F., of Ct., $20; S. W. A., of N. H., $50; J. L. H., of N. Y., $22; C. R., of N. J., $30; L. McD. & Co, N. Y., $20; J. I V., of N. Y., $30; W. W. B., of N. Y., $30; J. S., of Ga., $20; J. T., of N. Y., $30; W. & S., of Pa., $45; S. B., of N. Y., $30; L. F., of N. Y., $40; G. S., of N. J., $20; J. A. & G. C., of N. Y., $20; W. C. Van H., of N. Y., $30; O. C. S., of Mass., $23.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Feb. 21 :—

L. D., of Ct.; C. R., of N. J.; G. S., of N. J.; J. H., of Tex.; A. L. F., of Ct.; J. J., of N. Y.; J. A. & G. C., of N. Y.; W. C. Van H., of N. Y.; O. C. S., of Mass.

New Arrangement.

Several of our readers have expressed a wish to subscribe for some literary journal in connection with the Scientific American, not feeling able to take both. We have entered into an arrangement with the publishers of the "American Model Courier," of Philadelphia, and the "American Union," of Boston, which will enable us to furnish either of the two, with the Scientific American, for $3 per annum. They are literary journals of the first order, and are widely circulated in all sections of the country.

An Important Paragraph.

Whenever our friends order numbers they have missed—we always send them if we have them on hand. We make this statement to save time and trouble, to which we are subjected in replying when the numbers called for cannot be supplied.

The Post Office Laws do not allow publishers to enclose receipts; when the paper comes regular subscribers may consider their money as received.

Subscribers ordering books or pamphlets are particularly requested to remit sufficient to pay postage.

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An Apology.

We owe an apology to our 16,000 patrons for the space occupied this week by our advertising friends.

We have endeavored to keep the space appropriated for advertisements limited to two columns, by not admitting any of over 16 lines in length, but our rapidly increasing circulation has proved to advertisers that our columns surpass any other medium in the country for making the public acquainted with every species of business connected with mechanical and inventive pursuits, hence the unsolicited quantity of advertisements that has recently pressed upon our columns. To avoid the necessity of turning away advertising customers as we have been obliged to in many cases, lately, we have decided on increasing our rates of advertising to the following prices :—

4 lines,	for each	insertion,	- -	50cts.
8 "	"	"	- -	$1,00
12 "	"	"	- -	$1,50
16 "	"	"	- -	$2,00

Advertisements exceeding 16 lines cannot be admitted; neither can engravings be inserted in the advertising columns at any price.

Advertisements that are already paid for will be continued until the expiration of the time for which they are paid, at former rates, and then discontinued, unless the parties manifest a desire to have them continued at the advance rate, and remit accordingly.

☞ All advertisements must be paid for before inserting.

Back Numbers and Volumes.

In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:

Of Volumes 1, 2 and 3—none.

Of Volume 4, about 20 Nos.; price 50 cts.

Of Volume 5, all but 4 numbers, price, in sheets, $1, —complete sets, bound, $2,75.

Of Volume 6, all; price in sheets, $2; bound, $2,75

Of Vol. 7, all back numbers at subscription price.

Persons writing us without signing their names to the communication, are considered as not acting in good faith, or as mistaking the rules which govern all newspaper establishments, and are therefore not attended to.

ADVERTISEMENTS.

American and Foreign Patent Agency

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

MUNN & CO., Scientific American Office,
128 Fulton street, New York.

LATHES FOR BROOM HANDLES, Etc.—We continue to sell Alcott's Concentric Lathe, which is adapted to turning Windsor Chair Legs, Pillars, Rods and Rounds; Hoe Handles, Fork Handles and Broom Handles.

This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch and work as smoothly as on a straight line—and does excellent work. Sold without frames for the low price of $25—boxed and shipped with directions for setting up. Address (post paid) MUNN & CO.
At this Office.

IMPROVEMENT IN PIANOFORTES—CHROMATIC KEYS.—The difficulty of effecting rapid movements on the chromatic scale in running the fingers over the keys of the instrument, is well known to every practical musician, and this exercise requires playing many years to become perfect in it. By the invention of the chromatic keys, every pupil playing the piano will learn the chromatic scale and each difficult chromatic passage, in a few hours, with a rapidity of movement equal to the greatest pianists. This invention is simple cheap, and useful. More information may be obtained by letter addressed to the inventor, W. F. FURGANY, Albany, N. Y., who has taken measures to secure a patent. The price of a set of 1 octave chromatic keys is 75 cts. 24 2*

TO BLACKSMITHS—Porter's Patent Graduating Forge Tuyere, which has been proved to save $75 per annum to each fire, and which was illustrated and described in the Scientific American of Sept 6, 1851,—is now manufactured in this city, and is offered wholesale and retail at 258 Third st., near Avenue C, and No. 9 Gold st. New York. All orders or letters requesting information, addressed to W. J. & J. H. BURNETT, at the latter place, will meet with prompt attention. 24 2*

PHILADELPHIA SCHOOL OF CHEMISTRY—Boyd's Avenue, Tenth street, below Market. This Institution is conducted on the plan of the German Laboratories. Gentlemen may enter for the year, quarter, or month, daily, or tri-weekly, during the whole or part of the day, and pursue chemistry practically, in its connection with agriculture, medicine, or the arts. The analysys of ores, organic substances, &c., will continue to receive personal attention. ALFRED L. KENNEDY, M. D. 1*

DRAUGHTING BOARDS.—CHAMBERLIN'S PATENT, 23x29 inches, 28 feet of various scales, arranged for draughting of all kinds with dispatch, and mechanical device for ready adjustments of draught sheets, of thorough made and elegant appearance, approved by the American Institute, N. Y., and various other authority. Price with T rule $10, can be sent by express. Address, post paid, H. W. CHAMBERLIN, Pittsfield, Berksire Co., Mass. 24 4*

$150 REWARD—One hundred dollars for complete working drawings, with elevation of the same, of the most elaborate and best-proportioned Stationary Horizontal High Pressure Engine; bore 12 inches, stroke 30 inches. The design must combine with ornament, simplicity and cheapness of construction, and yet be susceptible of extreme finish, with as little hand labor as practicable. Fifty dollars reward, also, for the best Upright Engine, with same combinations, bore 10 in. stroke 20. The above are wanted for a special object, and the different designs will be submitted to a competent committee, who will make the awards. Heater, pump, and connections, and fly-wheel must be included.—Refer to W. B. Leonard, 60 Beaver st., N. Y. Open till March. Mail to A. Z. & Co., New York. 24 3

VENTILATION—In reference to the advertisement which I have had in this paper for some time, and also in reference to the reward offered by F. M. Ray "for the best method of excluding dust from cars when in motion," I beg to inform car building companies, railroad companies, and steamboat companies, that my patent includes the Ventilation of all these vehicles, and covers the whole ground of "excluding dust," &c. I expect to be in New York and Boston some time next month, of which notice will be given in some of the daily papers, as also of the place where I may be found. H. RUTTAN.
Coburg, Canada, Feb., 1852.

TO COTTON MANUFACTURERS AND MACHINISTS—The undersigned having had thirty-five years' experience in the manufacturing and machine business, is desirous of obtaining a situation as foreman or agent in the above branches; would have no objects to go South or West; the best of reference can be given. Letters addressed to CHARLES E MOORE, Groveville, Mercer Co., N. J., will be attended to promptly. 24 4*

MORTISING MACHINE.—Dear Sirs: I received the Portable Mortising Machine about 3 weeks ago; I have used it, and am very well pleased with it. It is the best plan of a machine of the kind I have ever seen. W. R. McFARLAND.
Nashville, Tenn., 1851.
This machine is simple, durable, and effective, and is boxed and shipped for the low sum of $20.
MUNN & CO.

TO ENGINEERS, RAILROAD COMPANIES or MANUFACTURERS—The advertiser, who is a thorough Engineer and Machinist, and has been extensively engaged in business (steam engines, and heavy machinery) for several years past, wants a situation as Superintendent, Manager or Draughtsman and Bookkeeper, in any operation requiring such qualifications. No objection to going to any part of the United States. Satisfactory testimonials can be produced as to qualifications and moral character. Communications addressed to THOMAS FRANCIS, No. 30 North Tenth st, Philadelphia, will receive prompt attention. 23 2*

A CARD—The undersigned begs leave to draw the attention of architects, engineers, machinists, opticians, watchmakers, jewellers, and manufacturers of all kinds of instruments, to his new and extensive assortment of fine English (Stubbs) and Swiss Files and Tools; also his imported and own manufactured Mathematical Drawing Instruments of Swiss and English styles—which he offers at very reasonable prices. Orders for any kind of instruments will be promptly executed by F. A. SIBENMANN, Importer of Watchmakers' and Jewellers' Files and Tools and manufacturer of Mathematical Instruments, 154 Fulton st. 23 13*

MACHINERY—1 Screw Bolt Cutting Machine nearly new; 2 new Dcik's Patent Punches, No. 2, suitable for boiler makers; 2 small ditto, and 1 bank-note or tobacco press, Dick's patent. One steam pump for supplying water to a 50 horse-power boiler, and several second-hand engines, different sizes, for sale at low prices by WM. D. ANDREWS, 187 Cherry and 452 Water sts., N. Y. 23 2*

IRON FOUNDERS MATERIALS—viz.: fine pulverized Sea Coal, Anthracite and Charcoal, Black Lead and Soapstone Facings. Iron and brass moulding sand; Core sand and flour; English Fire Bricks for cupolas, &c. Fire Sand and Clay—for sale by G. O. ROBERTSON Liberty place, (near the Post Office) N. Y. 23 10*

1852 TO 1856.—WOODWORTH'S PATENT Planing, Tongueing, Grooving, Rabeting, and Moulding Machines.—Ninety-nine hundredths of all the planed lumber used in our large cities and towns continues to be dressed with Woodworth's Patent Machines. Price from $150 to $760. For rights in Westchester County, and the other unoccupied towns and counties of New York and Northern Pennsylvania, apply to JOHN GIBSON, Planing Mills, Albany, N. Y. 23tf

DESIRABLE PROPERTY FOR SALE—The Dekalb Manufacturing Co. will offer for sale their Cotton Factory, Corn Mill, and Tannery, near Camden, S. C. The situation is pleasant and healthy, offering a very desirable investment for capitalists; the water-power is amply sufficient for all purposes; within one mile of the terminus of the Camden and South Carolina R. R., affording daily opportunity for the shipment of goods. The Cotton Factory is now in operation, making Osnaburgs and Yarns, and contains 1680 spindles, 20 30-inch cards, and 40 looms, in good condition, with machine shop attached, with lathes, cutting engines, etc. The Corn Mill received last year, as toll, 1400 bush. of corn: the Tannery has 36 vats, and bark mill. Will be sold on a credit of 1, 2, and 3 years, at public sale, 1st March; open for private sale until then Apply to THOS. LANG or WM. ANDERSON, Camden, S. C. 22 3

TO STAIR BUILDERS—The "UNIVERSAL STAIR BUILDER," just published by R. A. Cupper, Architect, New York, is a new treatise on the construction of Stair Cases and Hand-Rails, showing plans of the various forms of Stairs, with a new method of sawing the twist part of any hand-rail and joints square from the face of the plank, and to a parallel width, the same as for any horizontal work—which can be done at the saw-mill for one-sixth of what it cost by hand; the saving of material and labor is from 50 to 100 per cent. This system is now adopted in New York, Philadelphia, and Boston. It is pronounced by the most scientific Stair Builders to be the greatest discovery ever made. Price $6. For sale by Wm. Gowans. 178 Fulton st., N. Y.; Benj. Greene, 124 Washington st., Boston, and 240 West 26th st., N. Y. Books forwarded to any part of the United States an receipt of the money. 22 3*

VENTILATION.—Mr. Ruttan, of Coburg, Canada, is desirous of an opportunity to direct the erection (for ventilation) of a good dwelling or school house in the city of New York. For particulars inquire at the Scientific American Office. 15 10*

MACHINIST'S TOOLS.—Marshall, Bement & Colby, (successors to E. D. Marshall & Co.) Callowhill street, west of Schuylkill Third, Philadelphia, Pa., are prepared to make to order, and keep on hand Machinist's Tools, such as Planing and Compound Planing Machines, on a new and improved plan, Slide and Hand Lathes, Upright and Horizontal Drills, Upright Boring Machines, Improved Screw and Bolt Cutting Machines, with P. W. Gates' Patent Dies and Taps, or with the common Dies, Gear Cutting Engines, Slotting and Paring Machines. Also keep on hand Washburn & Whiton's Patent Scroll Chucks, of all sizes. All orders by letter or otherwise will receive their prompt attention. E. D. MARSHALL, WM. B. BEMENT, G. A. COLBY. 21 10 *

CHAS. W. COPELAND, Consulting and Mechanical Engineer, Surveyor of Steam Machinery, &c., No. 68 Broadway, N. Y., superintends the construction of steam vessels and steam engines, and machinery of every description; specifications and contracts prepared; also general plans and drawings in detail furnished. Steam engines surveyed and valued, and condition reported. Mr. C. also acts as agent for the purchase and sale of steam vessels, steam engines, boilers, &c. 21 10*

MALLEABLE IRON FOUNDRY, EASTON, Mass.—The subscriber continues to manufacture castings of every variety, for machinery and other purposes, of the best quality, at the above establishment. We have facilities for making castings 5 1-2 feet in length. Persons wishing castings can send patterns to Eastern Express, Boston, Mass. All letters will be promptly attended to.
21 10* DANIEL BELCHER.

CLOCKS FOR CHURCHES, PUBLIC BUILDINGS, RAILROAD STATIONS, &c., and REGULATORS FOR JEWELLERS.—The undersigned having succeeded in counteracting effectually the influence of the changes of the temperature upon the pendulum, and introduced other important improvements in the construction of clocks, are prepared to furnish an article, superior in every respect (the highest grade warranted to vary less than two minutes in a year) to any made in the United States. Ample opportunity will be afforded to test their qualities. Glass (illuminated) dials of the most beautiful description furnished. Address SHERRY & BYRAM, Oakland Works, Sag Harbor, Long Island, N. Y.
"At the Oakland Works of Sherry & Byram there are made some of the finest clocks in the world."—[Scientific American.
"Mr. Byram is a rare mechanical genius."—[Jour. of Commerce. 19tf.

THE EXCELSIOR Sand and Emery Papers. are offered as new and superior articles, being manufactured by an improved process; the paper is made from the best Manilla hemp, and consequently is very strong and lasting; the grit is of the sharpest and most enduring kind, and is firmly attached to the paper with a remarkable evenness of surface; their freeness from ridges, stripes, and other imperfections, recommend them to the notice of consumers. These papers have been used by many of our first mechanics, and are pronounced superior to all others. Every sheet is stamped WM. B. PARSONS, and warranted. Samples furnished at the office, No. 187 Water street, New York. WM. B. PARSONS,
14 6m* Sole Proprietor.

P. W. GATES'S PATENT DIES FOR CUTTING SCREWS—Patented May 8th, 1847.—This Die cuts Screws of any size, V or square thread, by once passing over the Iron. Also, Lead Screws for Lathes, Hoisting Screws, &c. All orders for Dies and Taps, with or without machines, will meet with prompt attention by addressing P. W. Gates, or Gates & McKnight, Chicago; Marshall, Bement & Colby, Philadelphia; Woodburn, Light & Co., Worcester, Mass. References—All the principal machine shops in New York, Philadelphia, and Boston. 13 6m*

METALLIC LETTERS AND FIGURES FCR PATTERNS.—

Price	3cts.	3cts.	3cts.	4cts.	4cts.	4cts.
Size,	5-16	3-8	7-16	1-2	9-16	5-8	3-4

6cts., 1 in.; 7cts., 1 1-4 in.; 8cts., 1 1-2 in.; 10cts., 2 in. Also Gothic Style: 3cts, 1-4 in.; 4cts., 1-2 inch. Manufactured by COWING & CO., Seneca Falls, N. Y. Orders solicited. They can be sent to any part of the Union, either by Mail or Express, as all packages are weighed and sent the cheapest way. 22 4*

THE SUBSCRIBER is now finishing four 14 horse engines, with boiler and apparatus all complete—price $1200 each. Several 6 horse engines extremely low: also, several of smaller capacity, completely; also, several power planers, now finishing. Galvanized chain for water elevators, and all fixtures—price low—wholesale and retail. Orders, post-paid, will receive prompt attention. AARON KILBORN.
No. 4 Howard st., New Haven, Ct. 23 10$

TO ARCHITECTS, SCULPTORS, &c.—The Commissioners of the Greene and Pulaski Monument Lottery Fund, offer Three Hundred Dollars for an approved design for a Monument, to be erected to the memory of Count Pulaski, in Chippewa Square, Savannah. Architects, Sculptors, Designers, &c., are invited to offer plans and specifications for selection, and to evince their own taste and judgment as to design, with no other limit than the cost, which must not exceed $17,000. Designs will be received until the 1st day of April, 1852, by the subscriber, from whom any further information may be had.
WM. P. BOWEN, Secretary.
Savannah, Geo., Jan. 13, 1852. 21 6*

TO INVENTORS.—I beg respectively to suggest that the establishment of a National Inventor's Institute, with regularly organized branches, would be the best means to assist your efforts to superintend your interests, and protect your patent rights. JAMES NIXON, Potosi, Wisconsin. 21 5*

ONE DOUBLE ENGINE of six-horse power, second-hand, used about one year; the size of cylinders, 4 inch bore and 12 inch stroke, and furnished with pump, regulator, and all attachments; the boiler is horizontal tubular, 7 feet long, 3 1-2 inches in diameter, and requires no brick to set it, the fire being made inside the boiler. The above engine will be sold for $400 cash, delivered in New York.
MUNN & CO.

TO FELLOE AND SNATH MAKERS—The undersigned having purchased the entire right of A. W. Johnson, for his machine for bending carriage felloes, &c., are now prepared to sell State or county rights for said machine; having used said machine for several years, we know it to be a saving in timber of 30 per cent, and more expeditious. Persons can see one of the machines at work at the manufactory of W. S. Johnson & Co., St. George's, Del.; also felloes of all kinds. Shafts and carriage stuff always on hand, and at prices to suit dealers in the above. WM. G. JOHNSTON & Co.,
22 10* St. George's, Del.

SCRANTON & PARSHLEY, Tool Builders, New Haven, Conn., have on hand six 12 ft. slide lathes, 28 in. swing; also four 8 ft. do.; 21 in. swing, with back and screw gearing, with all the fixtures; one 5 ft. power planer; 12 drill presses, 4 bolt cutting machines, 30 small slide rests; 5 back geared hand lathes, 21 in. swing; 15 do. not geared; 8 do. 17 in. swing on shears 5 1-2 feet; 25 ditto with and without shears, 13 in. swing; counter shafts, all hung if wanted suitable to the lathes. Scroll chucks on hand; also index plates for gear cutting. Cuts of the above can be had by addressing as above, post-paid. 9tf

BEARDSLEE'S PATENT PLANING MACHINE, for Planing, Tonguing and Grooving Boards and Plank.—This recently patented machine is now in successful operation at the Machine shop and Foundry of Messrs. F. & T. Townsend, Albany N. Y.; where it can be seen. It produces work superior to any mode of planing before known. The number of plank or boards fed into it is the only limit to the amount it will plane. For rights to this machine apply to the patentee at the abovenamed foundry—or at his residence No. 764 Broadway; Albany. GEO. W. BEARDSLEE. 23tf

WATTS & BELCHER, Manufacturers of Steam Engines, Lathes, Planing Machines, Power Presses, and Mechanics' Tools of all descriptions. Orders respectfully solicited and punctually attended to. Washington Factory, Newark, N. J. 7 20*

PAINTS, &c. &c.—American Atomic Drier, Graining Colors, Anti-friction Paste, Gold Size, Zinc Drier, and Stove Polish.
QUARTERMAN & SON, 114 John st.,
23tf Painters and Chemists.

MACHINERY.—S. C. HILLS, No. 12 Platt-st. N. Y. dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Machines; Woodworth's, Daniel's and Law's Planing machines; Dick's Presses, Punches and Shears; Morticing and Tennoning machines; Belting; machinery Beal's patent Cob and Corn mills; Burr mill and Grindstones; Lead and Iron Pipe &c. Letters to be noticed must be post-paid. 13 tf

WOODWORTH'S PLANING MACHINE—For sale, the right to use this justly celebrated labor-saving machine in the following States, viz., Pennsylvania west of the Allegheny Mountains, Virginia west of the Blue Ridge, Ohio, Indiana, Kentucky, Tennessee, Wisconsin, Iowa, Missouri, Arkansas, Texas, Louisiana, Florida, Alabama, and Mississippi. For particulars apply to the Proprietor, ELISHA BLOOMER, 208 Broadway. 17 12*

WOOD'S IMPROVED SHINGLE MACHINE—Patented January 8th 1850, is without doubt the most valuable improvement ever made in this branch of labor-saving machinery. It has been thoroughly tested upon all kinds of timber and so great was the favor with which this machine was held at the last Fair of the American Institute that an unbought premium was awarded to it in preference to any other on exhibition. Persons wishing for rights can address (post-paid) JAMES D. JOHNSON, New Haven, Ct.; or WM. WOOD, Westport; Ct., All letters will be promptly attended to. 22tf

LEONARD'S MACHINERY DEPOT, 109 Pearl-st. 60 Beaver N. Y.—The subscriber is constantly receiving and offers for sale a great variety of articles connected with the mechanical and manufacturing interest, viz.: Machinists' Tools—engines and hand lathes; iron planing and vertical drilling machines; cutting engines, slotting machines; bolt cutters; slide rests; universal chucks &c. Carpenters' Tools—mortising and tennoning machines; wood planing machines &c. Steam Engines and Boilers from 5 to 100 horse power. Mill Gearing—wrought iron shafting; brass and iron castings made to order. Cotton and Woolen machinery furnished from the best makers. Cotton Gins; hand and power presses. Leather Banding of all widths made in a superior manner; manufacturers' Findings of every description. P. A. LEONARD. 10tf

MANUFACTURE OF PATENT WIRE Ropes and Cables—for inclined planes, suspension bridges, standing rigging, mines, cranes, derick, tillers &c.; by JOHN A. ROEBLING; Civil Engineer—Trenton N. J. 47 1y*

RAILROAD CAR MANUFACTORY—TRACY & FALES, Grove Works, Hartford, Conn. Passage, Freight and all other descriptions of railroad Cars, as well as Locomotive Tenders, made to order promptly. The above is the largest Car Factory in the Union. In quality of material and in workmanship, beauty, and good taste, as well as strength and durability, we are determined our work shall not be surpassed. JOHN R. TRACY,
14tf. THOMAS J. FALES.

McCORMICK'S PATENT REAPERS AND MOWERS.—1700 of these machines, for which the great Medal of the World's Fair was awarded, are being manufactured at Chicago, Ill, with the intention of supplying the South-eastern States for the next harvest The gold medal of the Chicago Institute was recently awarded for this Reaper and Mower, tested against two other mowers, in cutting prairie grass; and the first premium of the State Agricultural Societies of Wisconsin, Michigan and Pennsylvania, were also awarded at their late Fairs. Price $120 at Chicago, and $122 delivered at Philadelphia; terms otherwise accommodating. 9tf

PATENT CAR AXLE LATHE—I am now manufacturing, and have for sale, the above lathes; weight, 5,500 pounds, price $600. I will furnish a man with each lathe, who will turn and finish axles for 50 cents each, if desired. I have also for sale my patent engine screw lathe, for turning and chucking tapers, cutting screws and all kinds of common job work, weight 1500 lbs., price $225. The above lathe warranted to give good satisfaction. J. D. WHITE, Hartford, Ct. 7 6m*

LOGAN VAIL & CO., No. 9 Gold street, New York, agents for George Vail & Co., Speedwell Iron Works, have constantly on hand Saw Mill and Grist Mill Irons, Press Screws, Bogardus' Horse-Powers, and will take orders of Machinery of any kind, of iron and brass; Portable Saw-mills and Steam Engines, Saw Gummers of approved and cheap kind, &c. Gearing, Shafting, large and small, cast or of wrought iron. 11 1y

HAWKIN'S Stave Dressing Machine—Is now in operation in the city of Milwaukie, Wis., and will dress from 6 to 8000 staves per day, ready for the truss hoops, and at one operation. Rights for States and Counties, and also machines, for sale, apply to WM. HAWKINS, Patentee, Milwaukie, Wis. 15 20*

A. B. ELY, Counsellor at Law, 46 Washington st., Boston, will give particular attention to Patent Cases. Refers to Munn & Co., Scientific American. 13tf

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SCIENTIFIC MUSEUM.

Scientific Memoranda.

NEW PROPELLER.—Mr. Seydell, naval architect at Stettin, (Eng.), and Mr. Ruthven an English engineer, have constructed a ship which is impelled neither by wind, oars, nor steam, but by retro-active hydraulic power. The essay they have made is said to have entirely succeeded.—[Ex.

[The above means that water is forced by an engine through tubes at the sides or stern of a vessel, which, by its re-action (the resistance the escaping water meets) propels the vessel. This was the principle of propulsion invented by our Rumsey sixty-seven years ago. The above gentlemen live in Edinburg, Scotland; we believe Mr. Ruthven has a patent for his improvements, as they are termed. The Scotch engineers of note do not seem to value the plan much. Its principle is not at all to be compared to the Paddle Wheel or the screw.

THE GREAT POLAR OCEAN.—At the last meeting of the London Geographical Society, Lieut. Osborne, a member of one of the British Arctic expeditions, argued, at some length, in support of the existence of a great Polar Ocean. He said that in Wellington Channel he had observed immense numbers of whales running out from under the ice, a proof that they had been to water and come to water, for every one knew they must have room to blow. He further said that there were almost constant flights of ducks and geese from the northward, another proof of water in that direction, since these birds found their food only in such water. He added, that it was his deliberate opinion, from observations made on the spot, that whales passed up Wellington Channel into a northern sea. In reference to the abundance of animal life in the latitude of this supposed Polar Sea, he remarked that while on the southern side of Lancaster Sound he never saw game enough to keep his dog, Melville Island, one hundred and fifty miles to the northward, abounded in deer and musk oxen. It was thus clear, he continued, that animal life did not depend on latitude, but increased, if anything, after passing the seventieth degree. Moreover, while in Baffin's Bay the tide made for the southward, coming from the Atlantic, in Barrow's Straits it made for the northward, which could only be explained on the hypothesis of a sea in that direction.

A CLIPPER FROM MAINE—The largest clipper-ship ever built in Maine, the Grecian, of 1131 tons, is now at New York, for California. Her length over all is 193 feet 6 inches, 37 feet beam, 8 feet between decks, and 11 feet 9 inches lower hold. Her model promises great speed, while at the same time her capacity for freight is larger than ordinary ships of her class. She rates at the underwriters at the highest point.

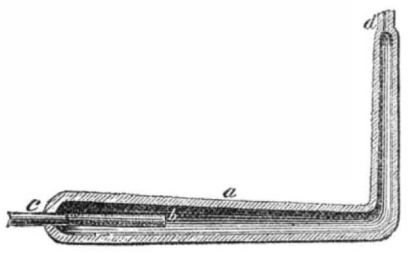
GOLD IN AUSTRIA—A report will soon be presented to the Imperial Geological Society of Vienna relative to the production of gold in Austria. Austria produces the most gold of any European State. It amounts yearly to 7,500 marks, which promises a sum of $1,206,000. Much of this is obtained by the Gipseys, by sand-washing, in Hungary and Siebenburgen. There are two ways in which the gold is found—one is in the deposits of sand and soil; the other in the strata of ore. The latter is the most common method of finding it in Hungary and Siebenburgen. A famous place for finding it in Hungary, is near Weisskirchen, where, by the Convent of Slatiska, a piece of gold was found, weighing three-quarters of a mark, and worth 126 dollars. The Gipseys are very clumsy in gold-getting.

NEW SUGAR PLANT.—Representations have been made by a cultivator in the Rhine Provinces, that he has in his garden a bulbous plant, called the "Russian Potato," four or five feet in height, and yielding a third more sugar than the beet-root. It is of inestimable value to a region unfavorable to the growth of the beet, and it is afforded at a much cheaper rate. Measures are taken to bring it into notice. Thus, we see, sugar must soon become a necessary article of food to the poorest serf in Europe.

On Boilers.---No. 14.

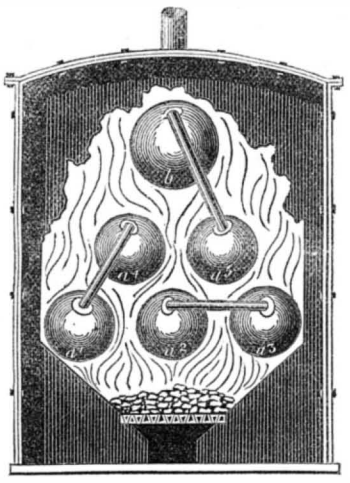
MCCURDY'S BOILER.—The accompanying figure, 24, is a longitudinal section of a boiler invented by Mr. McCurdy, of New York, who took out a patent for his invention in England in 1824, and afterwards sold it for a large sum of money. *a* is a tube of considerable thickness made of wrought iron. Its length is 11 feet, is of six inches diameter at the large end, and it tapers gradually to the other end. It is bent, and an injection barrel, *c*, is inserted at *b*. This barrel is perforated and is connected at the outer end with the

FIG. 24.



force pump: *d*, is the tube which conducts the steam to the engine. This invention was made before the nature of water in a spheroidal state was known, for this vessel was placed in a furnace, and after it was red-hot, water was forced in by the pipe, *c*, and being finely distributed by the perforations over the interior surface, it was instantly to be converted into steam of a very high pressure. It was asserted that this boiler was capable of generating as much steam as a common one of 150 cubic feet magnitude. It was, as we now know why, an entire failure.

FIG. 25.



This figure is an end view of another boiler, invented by Mr. McCurdy, and patented in 1825, in London, where he took up his residence. He denominated it "Franklin's Duplex Steam Generator." A number of large tubes were closed at both ends; on one end of each a head was fixed which could be taken off at pleasure. Inside of each of these tubes there was inserted a tube of smaller size, and leaving a space all around. These inner tubes united at the ends of two large tubes or pipes, which were placed in the furnace-like gas retorts. The top one was a reservoir for the steam. The lower large pipe, *a'*, like the one in figure 24, is connected to a force pump which forces water into it; it passes from that to a^2 a^3 a^4 a^5, and then into the steam reservoir, *b*, from thence to the engine. It was an improvment on figure 24.

In the same year, 1824, a Mr. Thompson, of Chelsea, England, along with a Mr. Barr, took out a patent for revolving boilers. Four cylinders were mounted on axes, each with a spur wheel, and these were placed in a furnace, and a rotary motion by machinery given to all the cylindrical boilers, (large tubes). The water was fed in through the axis of each tube, which was hollow and had a spring valve on its inside.

Electricity---Its Uses.

AMPUTATING LIMBS—Some operations have been performed lately at Vienna, Austria, by means of platina-wire heated red-hot, which had been found to sever the flesh with as much ease and celerity as a knife. One great advantage offered by this method, is the very slight effusion of blood caused by the wire as a dividing instrument. The way in which the platina is kept hot is by making it a part of a galvanic circuit. If the two poles of a galvanic battery are united by a copper wire of uniform thickness, no heat will be developed in the wire, but if part of the copper wire is taken out, and its place supplied with a thin strip of platinum, this strip will become red-hot, owing to the *resistance* (this is all the name yet used for the phenomenon) offered by the platina, because it is not such a good conductor as the copper. This principle is, we see, now employed to the noble object of surgical operations. It is an ingenious application of science. Electricity is now applied to send messages thousands of miles away in a few seconds; to record the transit of stars; to measure the flight of time; to deposit metals from aqueous solutions, and to make them assume any form we choose—that of the flower or "the human form divine;" to move ponderous machinery; and now it is applied to surgery. We cannot limit its applications; it is a versatile agent, recording the flight of the rolling spheres, and riving asunder huge rocks buried fathoms deep in ocean's bed.

Hussey's American Reaping Machine.

The Doncaster Gazette, Eng., states that in a trial in cutting down wheat stubble by Hussey's machine, which was introduced into the northern counties of England, by Mr. Crosskill, of Beverly, it did its work finely. The trial took place at a Mr. Ingles' farm. Here is what the Gazette says about it:—

"In some parts of the field the stubble was nearly rotton, and also much trodden down by the crowd of visitors present; but fearless of the bad season and the effect of the late frosts, Mr. Taylor started the reaper across ridge and furrow, and fully proved its superior cutting propensities, notwithstanding so many unfavorable circumstances. The trial was witnessed by many of the principal practical farmers in the neighborhood of Pontefract, who expressed their full approbation of its efficiency, in a certificate to Mr. Naylor, and we very willingly add the names of several other enterprising gentlemen, well known in this locality, who have given orders to Mr. Crosskill for reaping machines, viz:—Captain Newton, Womersley, Pontefract; M. Flaviell, Esq., Snydal Hall, C. Charnock, Esq., Ferrybridge, Pontefract; J. Brown, Rossington, Doncaster; E. Brook, Esq., Hampole, Doncaster; W. Poskitt, Esq., Birkin, Knotingly; W. Boulton, Esq., Kensall, Snaith. Doubtless many more will adopt this most valuable invention; and the plan of testing one reaper in every parish at this season of the year, upon stubble or winter tares, is deserving of consideration as it may enable many to decide to cut by the machine before next harvest."

We rejoiced when we heard of the success of McCormick's Reaper in England, and we now rejoice at the success of another American Reaper there.

Effects of Using Tobacco.

It is frequently asked whether the use of tobacco is injurious to the teeth and the health. In answer to which the inquirer may be respectfully invited to turn to his Cyclopædia, and when he reads of the powerful principles it contains, namely, empyrneumatic oil and nicotina, the action of both of which is highly poisonous,—(a drop of the former placed on the tongue excites convulsions and coma, lethargic drowsiness, and may prove fatal in a few minutes; and a quarter of a drop of the latter will kill a rabbit, and a drop a dog), will he not rather inquire how it can be otherwise than most injurious, not only to the teeth and gums, but indirectly, if not obviously, to every part of the frame? Beyond an unsightly discoloration of the teeth, and an empyrneumatical infection of the breath, of those accustomed to the use of this narcotic acid poison, its deleterious effects may not for a considerable period be detected; but after long habitual use, the whole system becomes impregnated; and although habit may reconcile its action when used moderately, nothing can secure the body from its irritative property and ultimate absorption when employed in excess or incautiously. Its action on the heart, or probably the nerves of the heart, manifest itself by lower positions, and an indulgence in an intemperate and excessive use of tobacco, by smoking a number of pipes and cigars, has caused death. Under the action of the nervous system, the motions of the heart, and subsequently the general quickness of the course of the blood, are quickened or retarded. All irritants and stimulants urge and force to a more vehement, and, consequently, a more rapid outlay of the strength or capacity for exertion; and it is an invariable law of organization, that outlay is succeeded by depression, and whatever unduly depresses, whether resulting originally from a stimulant, a narcotic, a sedative, or any other powerful principle, has the effect of lessening improperly the action of the heart and arteries; and it is on this account that neither intoxicating drinks, nor tobacco, nor anything else producing an affect which issues in depression, can be recommended for the promotion of health and longevity. I would therefore strongly recommend abstinence from the use of tobacco in all or any of its forms; not only on the ground of its rendering the teeth unsightly and the breath disagreeable, but because it is clear, to a demonstration, that it finally depresses the natural powers. Its use even in the forms of snuffs and errhines is very objectionable; the membrane of the nose becomes thickened, its sensibility impaired, and the power of discriminating odors greatly lessened.—[Miles on Teeth.

LITERARY NOTICES.

CHARACTERS IN THE GOSPEL—Illustrating Phases of Character at the present day: by E. H. Chapin; J. S. Redfield, publisher Clinton Hall, N. Y.—This volume of 160 pages, embraces six discourses by one of the most gifted minds of the age. The reasoning is logical, the applications finely made, and the style finished, replete with beauty and eloquence. The work will be found peculiarly interesting, and is published in Redfield's usual excellent style.

GODEY'S LADIES BOOK, for March, is received through Messrs. Long & Bro., 43 Ann st. In No. 22 we reflected somewhat severely upon the publisher of this popular Magazine, and now take occasion to state that he has explained the matter to our entire satisfaction, and we fully exonerate him from all blame. The number before us is replete with fine engravings and a choice contents from able contributors.

GRAHAM'S MAGAZINE, for March, is splendidly illustrated with a dozen engravings, executed in the highest style of the art, and embraces 112 pages of original matter from such authors as James, Neal Gilmore, Herbert, and others. Graham furnishes an excellent magazine. Dewitt & Davenport, Agents.

LIFE OF GEN. SCOTT.—We have received from the press of A. S. Barnes & Co., publishers, 51 John st., a copy of the life and military exploits of Gen. Winfield Scott. The book is neatly printed and copiously embellished, containing 290 pages, and sold in paper covers for 30c.

LITTELL'S LIVING AGE, of this week, is a most excellent number. It is for sale at Dewitt & Davenports, Tribune Buildings, this city.

Dewitt & Davenport have sent us the March number of Peterson's Ladies National Magazine. It is well illustrated, and contains a fine list of interesting contributions. The Editress, Mrs. Ann S. Stephens. is at her post.

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N. B.—The public are particularly warned against paying money to Travelling Agents, as none are accredited from this office. The only safe way to obtain a paper is to remit to the publishers.

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